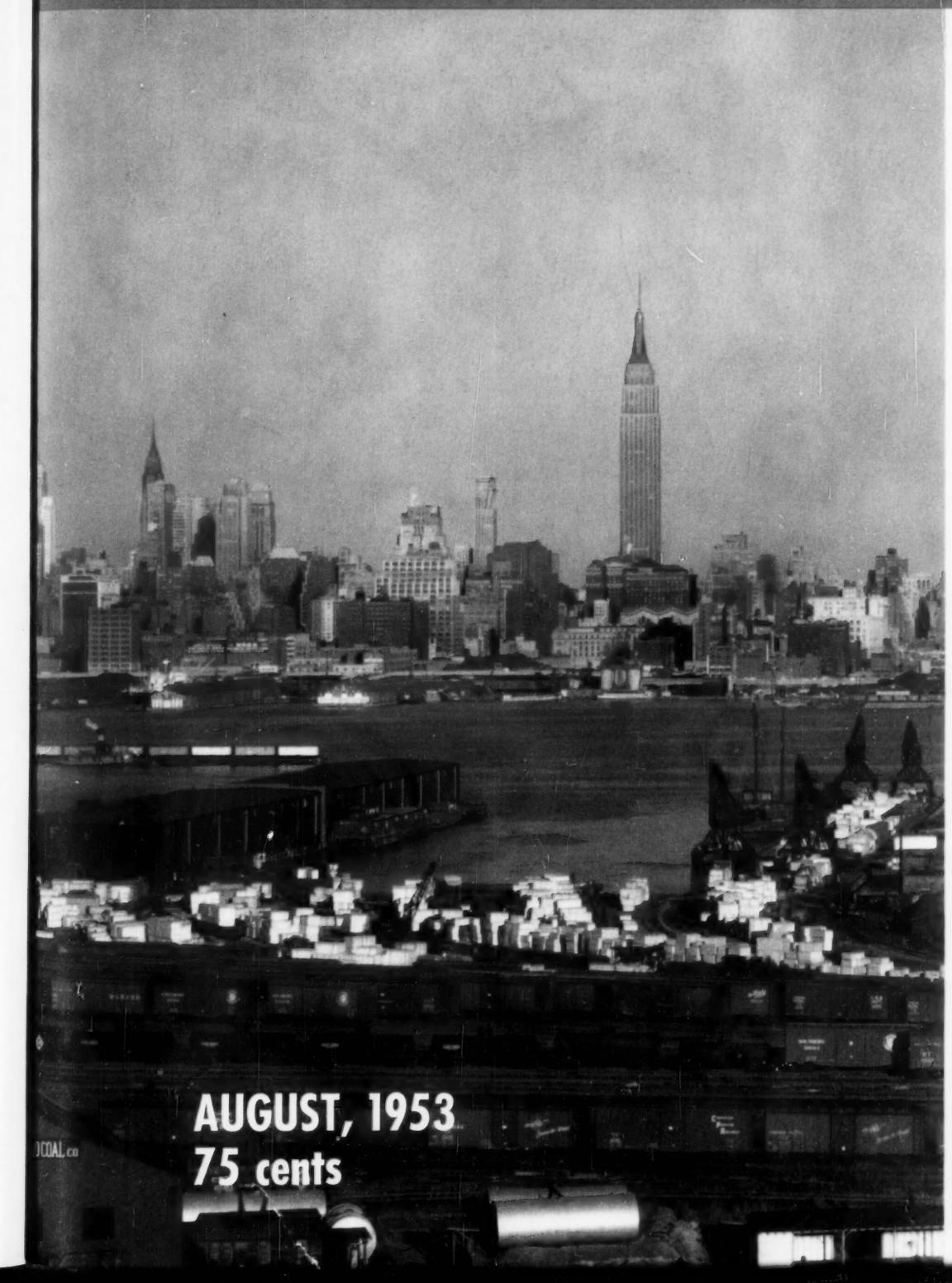
DUN'S REVIEW and Modern Industry

UNIVERSITY OF MICHIGAN
SEP 22 1953
BUSINESS ADMINISTRATION LIBRARY



AUGUST, 1953
75 cents

Speaking up FOR BUSINESS

CRAWFORD H. GREENEWALT

President, E. I. du Pont de Nemours & Co.

IN earlier times, when business units were small and technology was simple, the proprietor of an enterprise could hold all the reins firmly in his own hands. To-day it is only in a limited field that this condition prevails—certainly it is no longer representative of American industry. As production has become more complex, the tools and equipment have grown more expensive and the capital to buy them has had to come from groups of people rather than a few individuals. At the same time we have come to require more and more the services of specialists and technicians. Business has become, as a result, increasingly a team effort, in which the contributions of each individual and each group have to be integrated with the contributions of others.

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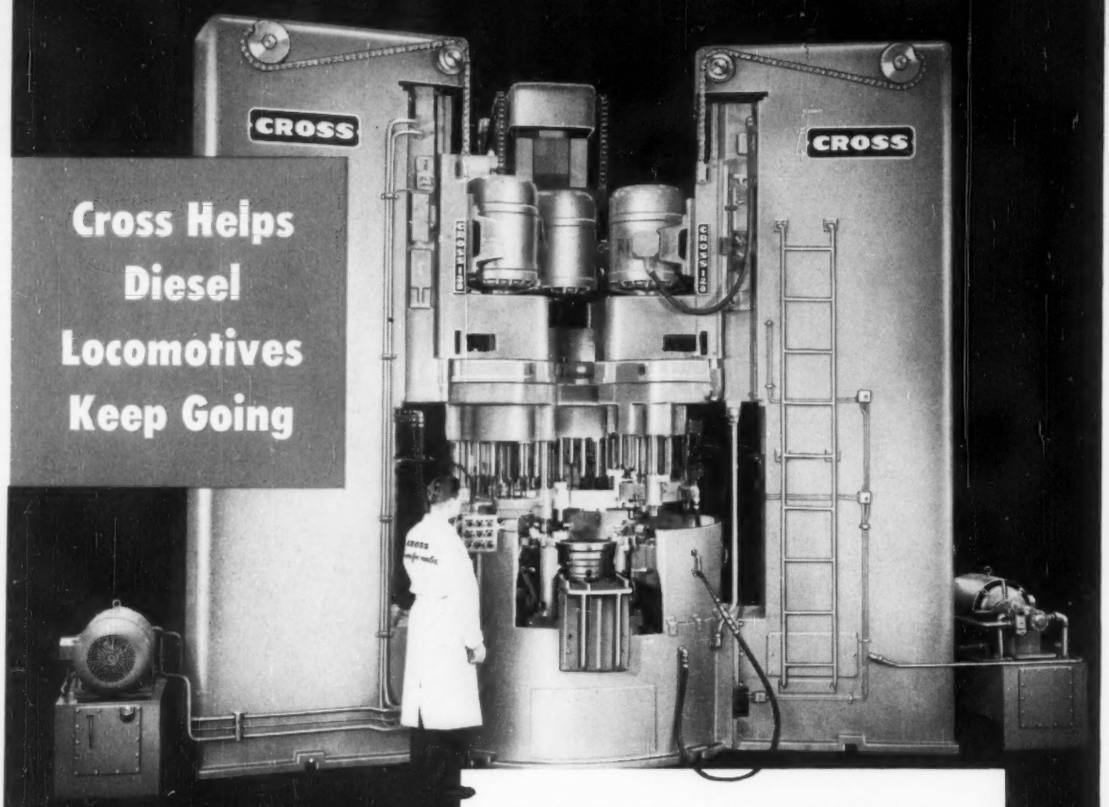
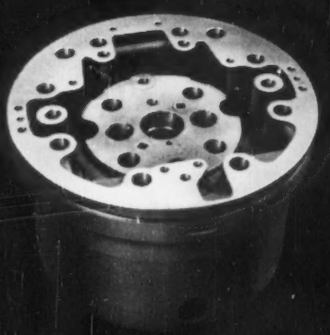
Another Special by Cross



Cross Helps Diesel Locomotives Keep Going



The familiar "Iron Horse" of the railroads—the steam locomotive—has given way to the modern diesel. This is in keeping with the American tradition of replacing capital goods when it becomes economically advantageous to do so.

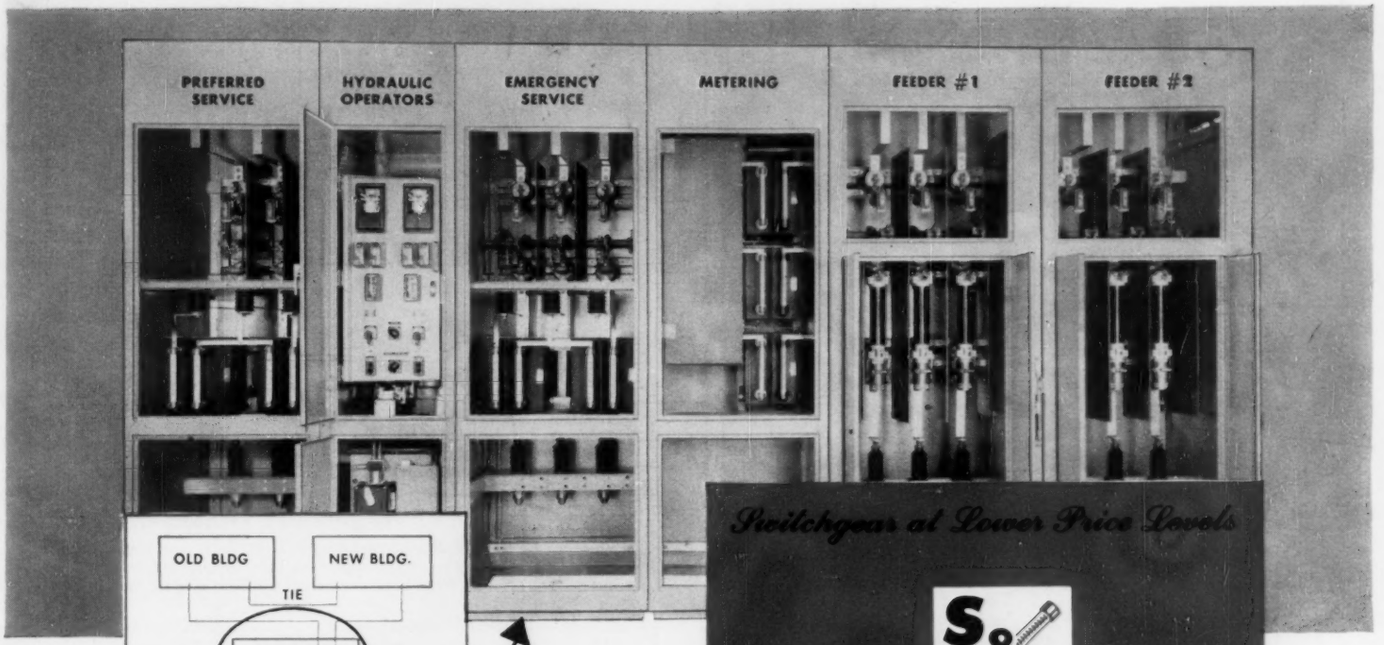
The manufacturers of diesel locomotives, recognizing the importance of this principle, are applying it to their manufacturing operations. They use Cross Special Machine Tools such as this one, which drills and reams cylinder heads.

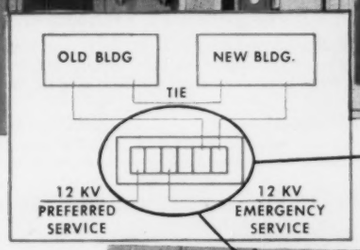
Established 1898

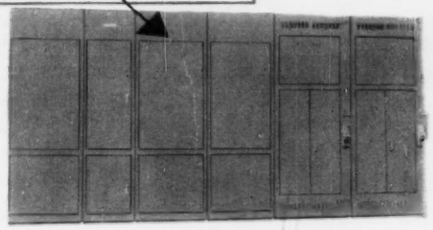
THE **CROSS** CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS







Switchgear at Lower Price Levels

S&C

METALCLAD SWITCHGEAR

reduces cost about half for switching centers

When a hospital recently undertook a modernization and expansion program, the enlightened use of this switchgear cut the cost of the switching center in half.

The 6-bay unit was installed to provide preferred and emergency sources of 12,000-volt power (with automatic throwover and return), and metering, plus switching and protection of the outgoing feeders to the load centers in each of two buildings. Secondary circuits are 220-volt 3-phase power, and 120/240 lighting.

The program also involved changing the supply voltage from 4 KV to 12 KV for greater over-all economy.

Scores of installations in a wide variety of industrial plants, public and commercial buildings have demonstrated beyond question that S&C reliability and performance cannot be surpassed . . . and you pay substantially less.

If you are planning a new installation, or have the job of modernizing an old one, don't let specifications leave the drawing board without first finding out how S&C Metalclad Switchgear can save you money.

Nearly always it affords the lowest cost way to a thoroughly reliable switching center or service entrance unit. Write for full information today.

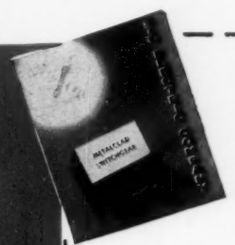
S&C ELECTRIC COMPANY

Formerly Schweitzer & Conrad, Inc.

4437 Ravenswood Ave., Chicago 40, Ill.

In Canada: Powerlite Devices, Ltd., Toronto

SPECIALISTS IN HIGH-VOLTAGE CIRCUIT INTERRUPTION



S&C Electric Company
4437 Ravenswood Ave., Chicago 40, Illinois

Please send me your new booklet on S&C Metalclad Switchgear. No obligation on my part, of course.

Name_____ Title_____

Company_____

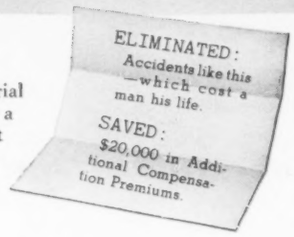
Address_____

City_____ Zone____ State_____

. . . THEN WE INSTALLED ALGRIP

And Ended Slipping Accidents And High Insurance Costs!

It happened at a large industrial plant, where oil and grease on a loading platform created a constant hazard. A lift truck skidded on the slippery surface, toppled from the platform's edge, and crushed the operator to death.



Then A.W. ALGRIP Abrasive Rolled Steel Floor Plate was installed on the platform—and slipping accidents ended at once. For ALGRIP is truly non-slip—even on steep inclines! Hundreds of tiny abrasive particles in each square foot of ALGRIP converted the slippery, dangerous platform into a hard gripping, anti-skid surface—safe for men and vehicles alike.

IMMEDIATE SAVINGS were obtained in three ways: *(1) No more costly, morale shattering accidents. (2) Faster handling of loads. (3) Workmen's compensation insurance premiums were substantially reduced by more than enough to pay for the* ALGRIP *installation.*

END SLIPPING ACCIDENTS THAT STEAL PRODUCTION AND KITE INSURANCE RATES

A.W. ALGRIP—only abrasive rolled steel floor plate in the world—pays for itself in savings from safety. Tough abrasive particles (same kind used in grinding wheels) put hundreds of tiny safety-brakes in every footstep —make it virtually impossible to slip even on steep inclines. ALGRIP doesn't wear smooth either—wear only exposes new particles. And tough rolled steel makes this floor plate stronger than other abrasive floorings. For safety at a saving, get the full ALGRIP story today. Write for our new Booklet AL-3—without obligation.

Over 125 Years of Iron and Steel Making Experience.

ALGRIP Abrasive Rolled Steel Floor Plate

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

Other Products: A. W. SUPER-DIAMOND Floor Plate • Plates • Sheet • Strip (Alloy and Special Grades)

DUN'S REVIEW and Modern Industry

AUGUST • 1953

Speaking up for Business 37
CRAWFORD H. GREENEWALT
President, E. I. du Pont de Nemours & Company
The light under the bushel may be yours. Business leadership has been dominant, but not prominent, but perhaps it is now time to take a bow

The Case for Mobilization Preparedness (first of two parts) 39
MELVIN ANSHEN
Professor, Carnegie Institute of Technology
Experience is no teacher unless those who have been tutored by her are willing to learn. What have we learned and how have we used it

Streamlining the Sales Forecast 42
There is a big difference between chance and risk. The calculated risk of future operations is often determined by sound forecasts to-day

What Went Wrong To-Day? 46
MARVIN L. WARNER and JOSEPH H. KANTER
The Warner-Kanter Companies
Ill winds can chase storm clouds as well as bring them. Making capital of silver linings pays dividends in this kind of approach

Morale Survey, Ready-Made Style 48
A new yardstick for morale has been devised that cuts costs, is easily applied, and goes a long way toward creating a set of useful standards

Aluminum 51
The most abundant metal in the earth's crust, lighter than glass, as hard as iron, it doesn't oxidize or tarnish. What can you do with it

Light, Color, and Design 58
HOWARD KETCHAM
Howard Ketcham, Inc.
The three dimensions for every product, every package, and every environment. Properly co-ordinated they form a team hard to beat

Your Emotions 59
The emotionless man is often the motionless man. Guided emotions can be an excellent stimulus if adequate control has been gained

Films for Selling 62
The cinematic salesman can be a help or a headache depending on apparent and obscure factors. Those factors are brought into focus

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Subscription: $5 a year in U. S. A. and Possessions, Canada, and Pan American Union. Elsewhere $10. Single copy, 75 cents. Staff personnel and other information appears on page 206. Copyright 1953 by Dun & Bradstreet Publications Corporation. Copyrighted under International Copyright Convention. All rights reserved under Pan American Copyright Convention. The titles DUN'S REVIEW and MODERN INDUSTRY are registered in the U. S. Patent Office. Cover: New York skyline from New Jersey; Devaney photograph. Frontispiece: Rockport, Mass.; Steffanson photograph.

. . . . what's in a name?

IT'S BEEN SAID often in the editorial offices that certainly one of the aims of the new DUN'S REVIEW AND MODERN INDUSTRY must be to retain and to build those editorial services that have developed for each of these magazines their loyal following among business executives.

Much of the individuality of DUN'S REVIEW and of *Modern Industry* is being retained and can be seen in this, the first combined issue of DUN'S REVIEW AND MODERN INDUSTRY. But the combination has produced a new and somewhat different magazine. One with its own individuality.

While it is new and different, we hope that it will not appear as a complete stranger to any of the many readers whose attachment for either of the two magazines was built upon a recognition of the service that it rendered. It is the aim of the staff to provide still greater service to the now vastly expanded audience of business men it is reaching. This is a big aim, but one that is well within reach. While the audience has grown considerably, we find that we are still addressing ourselves to business men who hold responsible positions in the top management ranks of industry and commerce.

The staffs of both the previous magazines are represented on the masthead on page 206 as a combined and unified group. We have pooled not only our interests and aims, but also our knowledge of the problems and needs of the people we have been serving. The staff holds to the firm belief that no segment of the top executive group in industry or commerce should be neglected in its efforts to provide the information necessary for business management to formulate sound policies and intelligent decisions in the light of constantly changing conditions.

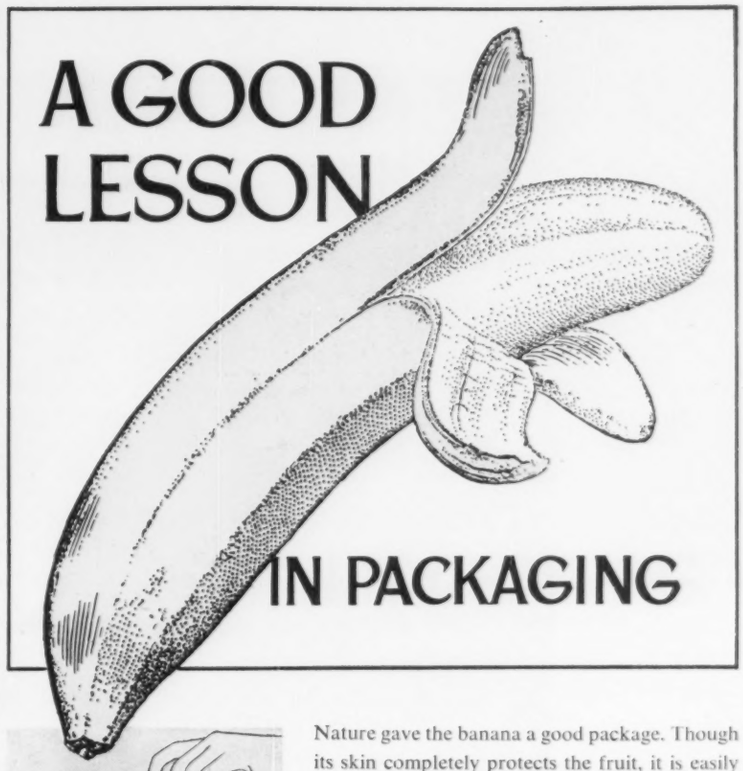
The articles written in this and in succeeding issues will be written both by outside contributors and by staff members. With this flexible approach it will be possible to include not only the first-hand opinions, ideas, and thoughts of acknowledged authorities and specialists, but also the unbiased reports of well-trained staff investigators and writers. Included in the subject matter will be such topics as executive training and development, new management techniques and methods, the results of business and economic research, business and Government activities, and information on current business conditions.

The departments in the magazines will continue to bring to busy executives in time-saving form the new products, new materials, new designs, new methods, new ideas, new books that will be helpful to them. There has been some modification and change in the titles of some of the departments, but these have been held to a minimum and were made primarily to avoid duplication or over-lapping. There has been no modification or change in the kind of material to be included here.

Much has been attempted toward retaining that rare combination of uncommon ingredients that make for success. In most forms of human endeavor success is not a static thing. This is true of magazines and will be true of this magazine. In molding the individuality of the new DUN'S REVIEW AND MODERN INDUSTRY to meet the changing needs of top management, the editors will constantly seek new fields in which to serve. They will always welcome suggestions for improvement; your comments will be especially helpful just now—the address is 99 Church Street, New York 8, N. Y.

The Editors

A GOOD LESSON IN PACKAGING



A few of the many products on which our machines apply easy-opening wraps

Nature gave the banana a good package. Though its skin completely protects the fruit, it is easily removed. And while you eat the banana, its skin serves as a convenient means of holding it.

Now lets look at machine-made wraps. Take a package of tissues. Here we devised an equally unique package. A tug of an easily grasped tab cuts a neat slit in the cellophane through which tissues are easily drawn. The wrap, however, remains intact, serving as protection for the remaining tissues. Increasing sales of tissues packaged in this manner are a good indication of what this improvement has done for leading makers of tissues, all of whom use our machines.

Better Packages . . . New Savings

This is but one of many packaging innovations developed by our engineering and designing staff. And the machines we build cover not only the wrapping of individual items, but bundling machines, bag-making and filling equipment, carton forming machines, etc. In short, Package offers not only the ingenuity that leads to new and better forms of packaging, but the machines that insure LOWEST COST.

Consult our nearest office

PACKAGE MACHINERY COMPANY
SPRINGFIELD, MASSACHUSETTS

NEW YORK CHICAGO BOSTON CLEVELAND ATLANTA DALLAS
DENVER LOS ANGELES SAN FRANCISCO SEATTLE TORONTO MEXICO, D.F.

You expect the best value from G-E fluorescent lamps

Watch the clock. Above are four unretouched photos taken about one second apart. On the left are regular fluorescent lamps, on the right the new General Electric *Rapid Start* fluorescent lamps. All were started at the same instant.

Within two seconds, all five G-E *Rapid Start* lamps are fully lighted. The regular lamps are only beginning to light.

Two new General Electric developments made the *Rapid Start* lamp possible: a triple coil cathode that holds more starting chemical and a *Rapid Start* ballast that pre-heats the lamp automatically. No starter needed. No wait for pre-heating. Starting is almost instantaneous, maintenance is simpler, cheaper.

Rapid Start lamps and ballasts are now available. You *expect* the best value from G-E fluorescent lamps. Here's one more reason why you can.

For free folder, "Facts About Rapid Start" write General Electric, Dept. 166-MI-8, Nela Park, Cleveland 12, Ohio.

New G-E fluorescent lamp starts quicker, needs no starter

You can put your confidence in—

GENERAL ELECTRIC

MANY votes were won for the extension of the excess profits tax when it was emphasized on the floor of the Senate that those who suffer most from high taxes are individuals, small unincorporated enterprises and partnerships. That argument defeated the proposed amendment to grant additional relief to small corporations. Had the amendment been adopted it would have opened the way for enough additional amendments to kill the bill. The extension of the excess profits tax, which seemed so unlikely when the session began, has added to the prestige of the administration.

Foreign trade policies of the United States will be examined during coming months with great minuteness. This is called for by legislation and by the exigencies of changing conditions. Although the United States engages in a larger volume of foreign trade than any other nation, special problems arise from the fact that exports constitute a small proportion of American production.

Pressure for lowering trade barriers is coming from powerful sources which have been indifferent to foreign trade policies in the past. Difficulties being experienced by foreign countries in earning dollars have resulted in curtailment of purchases of agricultural and manufactured products to an extent that makes imperative the intensive surveys that will be laid before the 1954 session of Congress.

★ Washington's No. 1 domestic problem is the budgetary deficit. Screening of expenditures and study of the tax structure are coming in for intensive attention. Internal Revenue is hunting for tax evasions as never before. The problem of the spread between income and outgo is complicated by unexpectedly large sums required for the price support program and by the failure of receipts to come up to the estimate.

Business was alarmed by the proportions of the Treasury's need for new money and by the curbing of credit expansion. Those fears have been largely allayed, however, by the fact that there are to be no more Treasury issues until September and by the fact that credit restrictions were not as severe as at first anticipated. Officials caution, however, that steps taken to meet the legitimate needs of commerce, industry, and agriculture should not be interpreted as a return to easy money. Assurances are being given that the monetary supply will be provided for growth that does not make for inflation.

★ Most economists in Washington for more than a year have been of the opinion that business would show no substantial decline in 1953. Dr. Edwin G. Nourse is a notable exception. While their thinking coincided with that of many business men it was at variance with majority opinion among economists in other sections of the country.

Developments are bearing out the Washington point of view, but officials are not blind to the fact that some of the activity-buoying factors are coming to an end. It is believed, however, that normal forces will grow as abnormal forces decline.

Pressure from farm groups and from export industries is having a noticeable effect on Congress. More will be done at the next session to remove barriers which make difficult the international exchange of goods. A decided change in United States policy is one of the prerequisites to convertibility of currencies. Other countries also will have to get their houses in order before a start toward convertibility can be made.

More effective aid in financing imports and exports will be forthcoming from the Export-Import Bank now that Congress has interposed no objection to the President's reorganization plan. In spite of its limitations, the bank's great value is in the selectivity with which it can operate in fields private capital declines to enter.

Paul Wooton

WASHINGTON, D. C.
JULY 1953

YOUNGSTOWN
Cold Finished
CARBON AND ALLOY STEEL BARS
Uniformly satisfactory in service because—
Machinability is outstanding
Tolerances are uniformly close
Metallurgical characteristics are rigidly controlled

QUALITY V YOUNGSTOWN SERVICE

FOR TOP QUALITY BARS

●ALL steel for Youngstown Cold Finished Bars is of predetermined analysis—produced in the open hearth by closely controlled blending and refining of raw materials. Rigid control from ore to finished product results in uniform dependability.

Youngstown Cold Finished Carbon and Alloy Steel Bars are furnished in standard shapes and sizes, in either coils or straight lengths. For further information, phone or write our nearest District Sales Office.

Youngstown COLD FINISHED CARBON AND ALLOY STEEL BARS

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.
PIPE AND TUBULAR PRODUCTS - CONDUIT - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS - SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES

VOICE OF INDUSTRY

Purchasing in a new perspective; how to make displays successful; an approach to objective advertising—from talks by industrial leaders.

HILL

"Are increased sales not the sure route to greater profits?"

New concepts in purchasing

In 1952 the sales of American manufacturers increased about 5 per cent. In the same year, profits—both before and after taxes—dropped off 7 to 15 per cent.

Now add these two facts together—sales up, profits down—and what answer do you get? Can it be that increased sales are not the sure route to greater profits?

To a predominantly sales-minded management—and there are many such—this is nothing short of heresy. Yet the facts are hard to refute. A profit, after all, is the difference between income and outgo. And the size of the outgo is just as important in determining the ultimate profit as the amount of income.

Some progressive managements have devoted a great deal of time and study to the problem of spending company funds. As a result, they have radically revised their concept of the purchasing function, what it should include, how it should be organized, what kind of people it requires, and what its relationship should be to other departments.

The revolutionary ideas which distinguish the new purchasing department from the old, it seems to me are embodied in five concepts basic to modern purchasing. These concepts either did not exist or weren't accepted in the past.

1. That purchasing is not a service function but a profit-making activity.
2. That where materials are a large part of the total cost, procurement is best handled as a separate and distinct function reporting directly to the chief executive or to some other top-level operating executive.
3. That the real purchasing job starts long before the specifications or requisitions are written.
4. That purchasing needs and deserves highly trained, competent personnel on a par with any other department of the business.
5. That purchasing should be represented in top operating councils.

JOHN A. HILL
President, Air Reduction Company, Inc., New York, to National Association of Purchasing Agents.

CROOKSTON

"Display advertising complements the line-age"

Displaying industrial products

Twenty-five years ago, no one would have dreamed of trying to sell industrial products by displaying them. After all, these were sold by technicians to technicians. In conventions, now and then, a company would shine up a transmission, have someone paint a sign, and—the product was on display!

Not so to-day.

There is hardly any product, large or small, intricate or simple, that does not use some form of "dis-

Your office, too, can be

Tooled for Efficiency!

STEELCASE

saves your space, increases your office output!

When you install Steelcase equipment in your office, you *know in advance* the result will give you more efficient use of space and increased work output. *Plus,* of course, the immediate favorable effect of Steelcase color, styling and beauty on your customers and employees alike.

Here's why:

Steelcase engineering and planning makes it possible to seat 25% more employees in a given area. Users report work output has increased as much as 35%.

Because Steelcase desk tops, drawers and pedestals are interchangeable, you can meet changing job requirements immediately. In *less* space than normally required, you gain *increased* filing capacity.

These factors—plus money saving Steelcase lifetime construction—are the reasons why more leading national organizations have consistently standardized on Steelcase. Ask your local Steelcase dealer for their names.

Look for your Steelcase dealer in the "Office Equipment" classification of your phone directory.

For new ideas in office planning, write for "Tooling Up Your Office"

STEELCASE
Business Equipment

METAL OFFICE FURNITURE COMPANY, Grand Rapids, Michigan

Caught... with our stamps down!

It was one of those frizzling fry-eggs-on-the-sidewalks Fridays. At ten o'clock the Old Man phoned and said that he wouldn't be in. "You take over, Henry," he says. Ha!

The afternoon was just one foul-up after another. A batch of invoices had to be done over, wrong discounts. Big Customer wired that his Urgent order hadn't arrived. The bank had a tizzy, dealer's check bounced. A blower in the factory went flooey. Fooey!

Then at 4:50, I find we're out of stamps—new girl forgot to buy 'em. And everybody wants to get away early on the weekend.

So who hustles down to the postoffice, stands in line, brings back the stamps, and sticks one on every blasted envelope? Me!

Monday bright and early, I phone the Pitney-Bowes place, and tell them, "You send up one of those baby postage meters, and I'll see that it stays here."

And the Old Man didn't even argue.

There's no argument about it! Even the smallest office can now afford a DM, the desk-model postage meter.

WITH the DM, you *print* postage as you need it, for any kind of mail, directly on the envelope, or on special tape for parcel post; and print your own small advertisement, if you like. There's also a moistener for sealing envelope flaps.

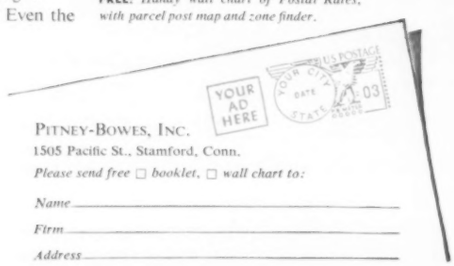
The postoffice sets the meter for as much postage as you want to buy. Postage in a meter is safe from loss, damage, theft—and automatically accounted for.

Anybody can use a DM. It's a great time and postage-saver.

There's a postage meter, hand or electric, for every office, large or small. Ask your PB office to show you. Or send the coupon.

FREE: *Handy wall chart of Postal Rates, with parcel post map and zone finder.*

PITNEY-BOWES
Postage Meter
Offices in 93 cities in U.S. and Canada



PITNEY-BOWES, INC.
1505 Pacific St., Stamford, Conn.
Please send free ☐ booklet, ☐ wall chart to:

Name _____
Firm _____
Address _____

continued

plays" in selling. A look at the budget picture will bear this out. In the early days of display selling, expenditures for trade shows and conventions were usually taken out of the general advertising budget. Advertising men grudgingly allotted these funds thinking that it was in competition with their space advertising in newspapers and magazines.

Time has proven this thinking wrong! Display advertising complements the lineage, it doesn't compete with it. As proof of this, we find that while budgets for space advertising have increased greatly, display budgets have mushroomed to prominence as a distinctly separate item.

Careful analysis of over 30 of the largest users of displays shows that display budgets are separate and get careful scrutiny to prove their productiveness, dollar-wise, and the most intelligent use of the many facets of display selling.

A three dimensional will be successful if it answers the following points: (1) Does it attract attention? (2) Does it "pull in" your audience? (3) Does it create interest? (4) Does it tell your story quickly and forcefully? (5) Does it stimulate further interest? (6) Does it dramatize your product or service? (7) Does it tell the whole story? (8) Does it sell *you*?

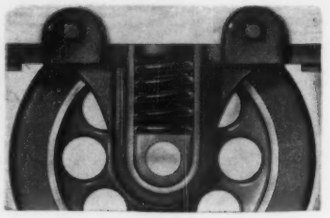
J. McLAIN CROOKSTON
Secretary-Treasurer, Gardner Displays Company, Pittsburgh, Pa., to Mid-Western Manufacturers' Association.

MANSFIELD

"Reports and research should be done by an impartial group"

Advertising and its problems

Why is it that year after year the advertising manager must constantly be on the defensive and constantly have to justify his budget? Because advertising is still treated as the *result* of sales, not as the



Special tempered spiral springs keep load level while absorbing shocks of an uneven floor.

PRODUCT SAVER
MAN SAVER
FLOOR SAVER

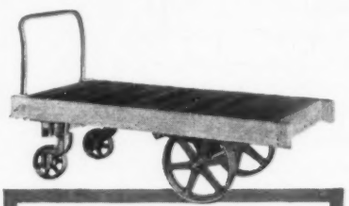
Weld-Bilt

SPRING BEARING TRUCKS

Here's the answer to your problem of moving materials more efficiently, with maximum protection to product, trucker and floor.

On Weld-Bilt Spring Bearing trucks, your materials move without jarring or vibration. Your truckers work faster and easier, with less fatigue. Floor drains and door sills are protected against damage, as wheels "step" over obstruction.

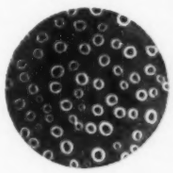
Because of Weld-Bilt's shock-absorbing spring bearings and other superior mechanical features, trucks last as much as 50% longer. Spring Bearings are featured on Weld-Bilt platform trucks of all styles and designs. Write for bulletin.



WEST BEND EQUIPMENT CORP.
Materials Handling Engineers
303 WATER STREET, WEST BEND, WIS.

RIGHT IN YOUR OWN BACK YARD...
BY WEST
BUGS KNOW IT'S THE KISS OF DEATH WHEN THE WEST MAN TURNS ON THE NEW ATOMIZER
A TWIST OF THE WRIST AND IN TWO MINUTES THIS PLANT WILL LOOK LIKE A LONDON FOG!
WOW! THIS JOB USED TO LOUSE UP THE WEEKEND FOR FIVE MEN. AT DOUBLE TIME!
WEST ATOMIZERS? WOW! WE'RE SITTING DUCKS IN THIS CRACK!
YOU'LL STILL SWING A MOP, THUNDERFOOT. THIS IS A BUG KILLER, NOT A JANITOR!
BET THIS BLOWS MY JOB RIGHT OUT THE WINDOW!
TRAPPED BY VAPOSECTOR! SAME DIRTY TACTICS THAT WIPED OUT OUR COUSINS AT THE CANNERY!
JIGS UP! IT'S THIS OR WEST FUMIGANTS OR WEST RESIDUALS!
WHAT STRATEGY! THEY'VE MAPPED OUT AN INSECT CONTROL PLAN THAT'S STOPPED US COLD!
HEY! WAIT A MINUTE... WHO'S GONNA CARRY US OUT?

Fog 1,000 cu. ft. in 3 seconds for 5¢



Top — Magnified photo of uniform 8 micron droplets produced by precision-machined suction nozzles of West Atomizing equipment. "Dry mist" remains air-borne for prolonged periods.

Bottom—Magnified photo of droplets produced by ordinary hydraulic compressor sprayers. Vary from 2 to 300 microns. Larger droplets fall, wetting floors and reducing effectiveness.

— and with only 1 ounce of Vaposector — for complete control of flying insects. Double this dosage for crawling insects.

Impossible? Not with a permanently installed West Atomizer. 10 suction nozzles atomize a "dry mist" of extra-potent insecticide. Droplets are so small they hang in the air . . . seep into every crack . . . penetrate delicate insect breathing tubes.

It's an unbeatable combination. High potency Vaposector — sprayed with super-efficient West atomizing equipment. One man does the job. There's only one valve to open. You can fog your entire plant simultaneously.

West has a complete line of insecticides and atomizing equipment ranging from permanent installations to portables. A West specialist will be glad to make a survey and set up an Insect Control Program to fit your needs. Without obligation. Just mail the coupon.

WEST DISINFECTING Company

42-16 West Street, Long Island City 1, N. Y.

YES! Tell us about your Insect Control Plan

☐ Please send me the West Insect Control Booklet

☐ Have a West Insect Control Specialist call DEPT. 1

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

Steel

Certified Quality

•

The World's Largest Stocks

•

Carbon, Alloy, Stainless

•

Fifteen Plants from Coast to Coast

•

Metallurgists and Veteran Steel Men

•

Sawing, Shearing, Flame Cutting

•

Immediate Shipment

•

This is

Ryerson Steel Service

PRINCIPAL PRODUCTS IN STOCK: CARBON, ALLOY AND STAINLESS STEELS • BARS STRUCTURALS • PLATES • SHEETS • TUBING • METAL WORKING MACHINERY AND TOOLS • GLYCO BABBITT METAL • RYERTEX PLASTIC BEARINGS

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

continued

cause of sales. Too, there is a lack of concentrated attention in advertising to solving our immense distributive problems. And it is this lack of foresight which could very well determine the length and depth of any future economic recession.

Is advertising ready at this time to cope with the problems which would arise if Government cutbacks were the order of the day? I don't believe it is, although now is the opportune time to plan for such a contingency.

In the event of Government cutbacks, does advertising have all of the facts on potential consumer markets in order to create demand at a profit? Too many of us hope to resurrect the old, moth-eaten tricks, dust them off, and use them all over again. But these may not be sufficient to keep us out of trouble.

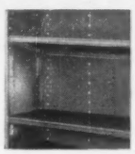
Many advertisers to-day are unable to see the forest for the trees. And in this instance, the trees are often the reports and research of agencies, media men, and I fear, our own sales departments. Agencies, like individuals, are very apt to be subjective in their approach to a situation or problem. In other words, it is extremely difficult and well-nigh impossible to be objective about yourself and your work. This is certainly understandable. Granted that the long-term interests of the ad manager, the agencies, and the media men are all the same, in many cases short-range objectives are diametrically opposed. To be truly objective, reports and research should be done by an impartial group, and ad managers, agencies, and media will find that their mutual effectiveness will thereby be greatly increased.

It seems to me that the advertising budget should be considered as something more than just in a fixed relationship to sales. I believe we should treat it more in terms of its objectives, and the cost of attaining those objectives. Perhaps our problem to-day is not that we are spending too much money on advertising, but rather that we are not spending enough.

F. W. MANSFIELD
Director of Sales Research, Sylvania Electric Products, Inc., New York, to Canadian Association of Advertisers.

THE REAL COST OF SHELVING IS THE ERECTED COST

3 reasons why



De Luxe Steel Shelving costs you less

1. **Fewer Parts**—DeLuxe has designed one part where ordinary shelving uses three. Example, our bin-type "I-Beam" upright. *Fewer parts mean fewer man hours to install.*
2. **80% Less Bolts**—DeLuxe shelving uses patented, boltless shelf brackets, thus requires *no tools* for either installation or adjustment.
3. **100% Adjustable**—Shelves in each section are independently adjustable, without disturbing other contents. DeLuxe shelving erects on the spot, in position where you want it . . . the only shelving that does all this.

There is a DeLuxe factory representative in your area who will give you our engineering, planning and layout service without obligation. Write today for free catalog.

DeLuxe

De Luxe Metal Furniture Co.
301 Struthers St., Warren, Penn.

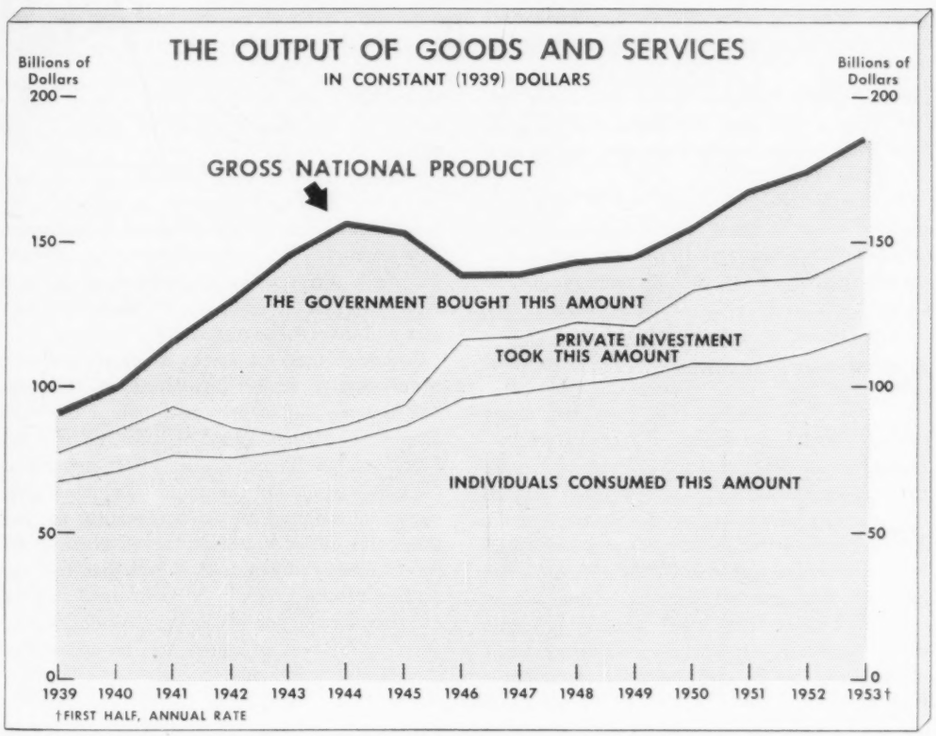
For over 25 Years Manufacturers of: Storage Shelving Library Shelving • Storage Cabinets • Shop Equipment

Compass Points— OF BUSINESS

A U G U S T • 1 9 5 3

SUPPLEMENT TO DUN'S REVIEW and Modern Industry

Underlying strength was reflected in the economic indicators in the first half of 1953, pointing toward a broad basis for stability in the fourth quarter



THE general level of business was never so high as in the first half of 1953. Goods and services were produced at a record rate, requiring an unprecedented employment roll. Business sales expanded, surpassing the year-ago levels by a comfortable margin. Incomes advanced, while prices tended to level off; buyers found that they had more dollars to spend than a year ago, that the dollars often might buy more. To some business men, the situation didn't look quite this good, but the figures are in the Compass Points on pages 23 and 24.

Optimists, pointing to the happy facts, could still be asked some embarrassing questions. Much of the increase in business sales could be attributed to the burst of activity in automobiles which followed the decontrol of vital metals. New car sales, while impressively high, were sometimes thought overly dependent on easy credit terms; this at a time when consumers' short-term debts reached a new pinnacle at the end of each reckoning period (Compass Point 33 on page 24).

Many observers thought that psychology might play as important a part in evaluating the future as economics. It has been proved that

the loss of faith may have very damaging repercussions when it is expressed in curtailments in investment and buying. It was encouraging that both consumers and business men looked forward to the rest of 1953 with assurance.

Confidence prevailed . . .

. . . among the 1,281 executives interviewed in the most recent DUN & BRADSTREET survey of business men's expectations. It appeared that the fourth quarter of 1953 would find most businesses in at least as favorable a condition as in the first half year.

A large majority (86 per cent) of the executives thought that their net sales in the fourth quarter of 1953 would be as high as, or higher than, in the similar period of 1952. Although the wholesalers were usually less optimistic than the other business men, only 16 per cent of them expected their sales to fall below a year ago.

The weight was on the side of stability in selling prices and employment. Some 59 per cent of the business men thought that their selling prices would be unchanged from a year ago. More than three-quarters (77 per cent) expected to have as many people on their payrolls.

The executives expecting their fourth-quarter net profits to exceed last year's level outnumbered those who expected a decline in profits by almost three to one. Higher year-end inventories were anticipated by less than one-third of the business men, while 44 per cent thought that there would be no change.

The manufacturers expecting their new order volume to rise above the 1952 comparative were more than four times as numerous as those expecting a decline. Manufacturers of durable goods expected an increase in orders somewhat more frequently than did the producers of non-durables.

Expansion programs . . .

. . . were undertaken by business at a faster pace in the first half of 1953 than it was earlier expected. New plant and equipment outlays in the first nine months of 1953 were scheduled at about 7 per cent above the 1952 comparative. The year-to-year increase for 1953 as a whole may not be quite as large as 7 per cent. The steel strike in the third quarter of 1952 restricted the construction of new facilities then, so that comparisons with the similar period this year are somewhat distorted. But it is thought likely that fixed capital investment programs for the full year 1953 will reflect a greater increase from 1952 than the 2 per cent reported by business this Spring.

Capital spending was expected to rise to an annual rate of $28.7 billion in the third quarter of 1953 from $27.8 billion in the first half year. Larger than average increases from a year ago were planned for the chemicals, beverages, petroleum, and paper industries. While textile companies were the only major non-durable goods industry group to expect appreciably lower outlays than a year ago, the expansion plans of food and rubber companies were moderately below last year's rates.

Machinery and fabricated metals producers planned to spend about one-third more for new facilities than a year ago. In primary metals and motor vehicles, plans to add new productive capacity were sustained at last year's record rates.

A car dealer's dilemma . . .

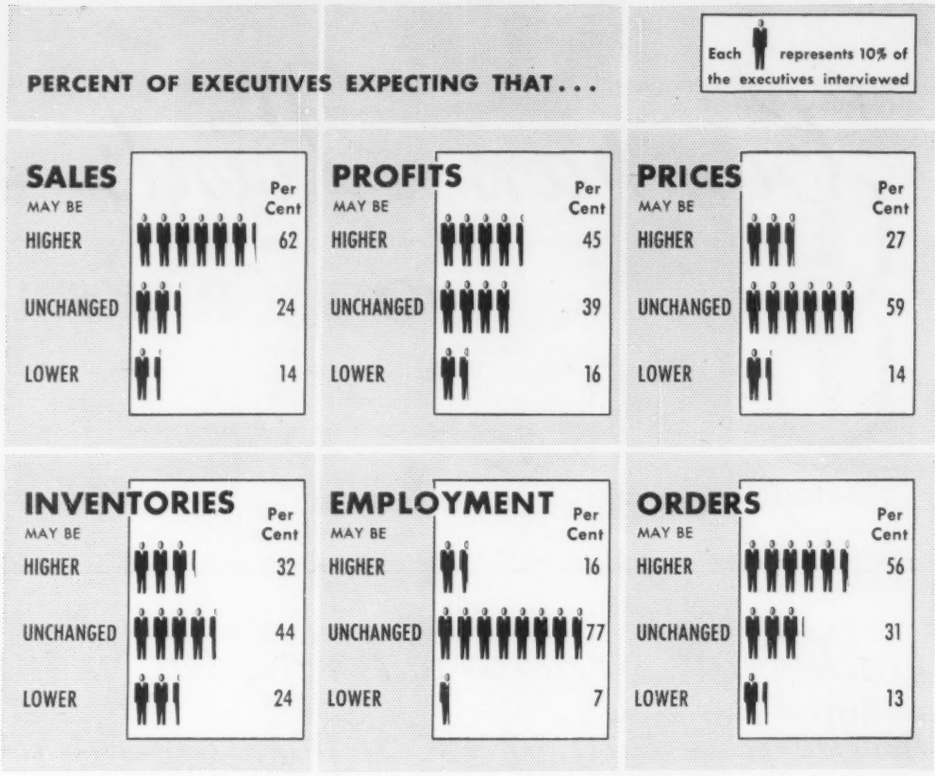
. . . developed in used cars. Even with automobile production at record levels, averaging about 47 per cent above a year ago in the first six months of 1953, it was fairly easy to sell new cars almost as fast as they were made. Relaxed credit terms made it convenient enough for purchasers to spread out their payments; the financial arrangements were such that a new car could be bought for lower monthly payments than a used car. Automobile installment credit rose 40 per cent in the year after credit curbs were lifted, to something over $9 billion, a record high. While the quoted new car prices were maintained at high levels, in spite of sharpening competition, used car prices slumped steadily. It was estimated that the average used car cost about $200 less this June than a year ago, a decline in the used car price of nearly 20 per cent.

Dealers, eager to keep the new models moving, often increased the trade-in allowance beyond limits which appear practical in retrospect. The losses they may take on the resale of trade-ins are a threat to some profit margins. It is estimated that at least two-thirds of the new cars sold involve the trade-in of a used car.

Although used car stocks mounted, the ratio of automotive dealers' inventories to sales was not seriously out of line, as a look at the chart on page 73 of the "Trend of Business" will tell. Moreover, an intensive sales effort appears in the offing. Several of the major automobile companies started used car departments for the first time, and others increased the advertising and promotional campaign. It is felt that the production of new cars will be maintained at a record pace for the rest of the year. Model changeovers in the Fall, of course, can be expected to limit output somewhat.

Consumers' plans . . .

. . . presaged that people might respond well to intensive selling. The Federal



Optimists were in the majority among the 1,281 executives asked how they expect the sales, earnings, and other aspects of their business in the fourth quarter of 1953 to compare with the similar period a year ago. More than six out of every ten of the business men anticipated an increase in sales, while those who expected higher profits outnumbered those expecting lower profits by nearly three to one. The executives represented a random cross-section of the larger, representative business concerns in the nation.

39 COMPASS POINTS OF BUSINESS

CENSUS

1 POPULATION *Millions*	2 NUMBER OF BUSINESSES *Thousands*	
99.1	...	1914
105.1	...	1919
106.5	...	1920
108.5	...	1921
121.8	3,097	1929
123.1	3,062	1930
124.0	2,984	1931
124.8	2,895	1932
130.9	3,306	1939
132.0	3,383	1940
133.2	3,364	1941
134.7	3,302	1942
136.5	3,045	1943
138.1	3,062	1944
139.6	3,258	1945
141.2	3,605	1946
144.0	3,879	1947
146.6	3,991	1948
149.2	3,965	1949
151.7	3,980	1950
154.4	4,009	1951
157.0	4,044	1952
156.0	4,036	I
156.6	4,050	II
157.4	4,059	III '52
158.0	4,044	IV
158.7	4,049	I
159.3	4,053	II '53

EMPLOYMENT

3 EMPLOYMENT Civilian *Millions*	4 EMPLOYMENT Agricultural *Millions*	5 EMPLOYMENT Nonagricultural *Millions*	6 UNEMPLOYMENT *Millions*	
37.6	11.4	26.2	...	1914
42.0	10.5	31.5	...	1919
41.3	10.7	30.6	...	1920
37.7†	10.8†	26.9†	...	1921
47.6	10.0	36.3	1.5	1929
45.5	9.9	34.3	4.3	1930
42.4	9.8	31.3	8.0	1931
38.9	9.7	28.0	12.1	1932
45.8	9.3	35.6	9.5	1939
47.5	9.5	38.0	8.1	1940
50.4	9.1	41.3	5.6	1941
53.8	9.3	44.5	2.7	1942
54.5	9.1	45.4	1.1	1943
54.0	9.0	45.0	.7	1944
52.8	8.6	44.2	1.0	1945
55.2	8.3	46.9	2.3	1946
58.0	8.3	49.8	2.1	1947
59.4	8.0	51.4	2.1	1948
58.7	8.0	50.7	3.4	1949
60.0	7.5	52.5	3.1	1950
61.0	7.1	54.0	1.9	1951
61.3	6.8	54.5	1.7	1952
59.7	6.1	53.6	2.0	I
61.3	7.2	54.1	1.7	II
62.3	7.4	54.9	1.6	III '52
61.9	6.6	55.3	1.4	IV
61.0	5.5	55.5	1.8	I
62.0	6.8	55.2	1.5	II '53

PRICES

7 CONSUMERS' PRICES *Index*	8 RETAIL PRICES *Index*	9 WHOLESALE PRICES *Index*	10 INDUSTRIAL STOCK PRICE AVERAGES *Dollars*	
42.9	...	43.3	81.03	1914
74.0	...	88.1	99.78	1919
85.7	...	98.1	90.04	1920
76.4	...	62.0	73.48	1921
73.3	120.9	61.9	311.24	1929
71.4	...	56.1	236.34	1930
65.0	...	47.4	138.58	1931
58.4	...	42.8	64.57	1932
59.4	99.0	50.1	142.66	1939
59.9	100.6	51.1	134.74	1940
62.9	108.3	56.8	121.82	1941
69.7	124.9	64.2	107.20	1942
74.0	134.0	67.0	134.81	1943
75.2	137.5	67.6	143.32	1944
76.9	141.4	68.8	169.82	1945
83.4	155.2	78.7	191.65	1946
95.5	180.1	96.4	177.58	1947
102.8	192.7	104.4	179.95	1948
101.8	187.7	99.2	179.48	1949
102.8	189.0	103.1	216.31	1950
111.0	206.8	114.8	257.64	1951
113.5	210.4	111.6	270.76	1952
112.6	209.5	112.6	267.13	I
113.1	210.2	111.5	264.18	II
114.2	211.6	111.9	275.09	III '52
114.2	210.2	110.5	276.69	IV
113.6	208.3	109.8	286.40	I
114.2	209.0	109.5	273.00	II '53

Table Continued on Page 24

SALES

21 FARM RECEIPTS *Million dollars*	22 EXPORTS *Million dollars*	23 IMPORTS *Million dollars*	24 RETAIL SALES *Million $*	25 WHOLESALE SALES *Million $*	26 MANUFACTURING SALES *Million $*	
6,039	2,114	1,789	...	...	...	1914
14,570	7,920	3,904	36,549	...	60,509	1919
12,606	8,228	5,278	41,364	...	63,659	1920
8,116	4,485	2,509	32,954	...	41,897†	1921
11,299	5,241	4,399	48,459	37,814	70,262	1929
9,050	3,843	3,061	41,989	...	57,017	1930
6,369	2,424	2,091	34,752	...	42,951	1931
4,735	1,611	1,323	25,013	...	30,774	1932
8,582	3,177	2,318	42,042	26,244†	61,340	1939
9,056	4,021	2,625	46,375	28,919	70,313	1940
11,619	5,147	3,345	55,274	36,394	98,069	1941
16,136	8,079	2,756	57,212	41,109	125,158	1942
20,003	12,965	3,381	63,235	45,966	153,843	1943
21,153	14,259	3,929	70,208	49,828	165,387	1944
22,125	9,806	4,159	78,304	53,708	154,481	1945
25,336	9,738	4,942	102,488	71,915	151,402	1946
30,020	14,430	5,756	119,604	87,263	191,010	1947
30,464	12,653	7,124	130,521	95,172	211,560	1948
28,129	12,051	8,622	130,721	88,252	196,997	1949
28,611	10,275	8,852	143,689†	97,666	231,746	1950
32,908	15,030	10,967	158,223	107,203	268,014	1951
33,417	15,165	10,714	164,124	106,044	276,516	1952
6,807	4,025	2,779	36,322	25,048	67,881	I
6,657	3,992	2,628	41,563	24,443	67,081	II
9,213	3,339	2,533	40,465	26,818	67,441	III '52
10,741	3,787	2,774	45,772	29,661	74,260	IV
6,656	3,851	2,783	39,345	25,654	74,810	I
6,400	4,000	2,800	43,600	25,000	76,400	II '53

INVENTORIES

27 RETAIL INVENTORIES *Million $*	28 WHOLESALE INVENTORIES *Million $*	29 MANUFACTURING INVENTORIES *Million $*	
...	...	...	1914
...	...	12,906	1919
...	...	13,484	1920
...	...	10,705†	1921
7,298	4,024	12,775	1929
...	3,497	11,265	1930
...	2,665	9,105	1931
...	2,307	7,332	1932
5,285	3,075†	11,516	1939
5,819	3,255	12,873	1940
7,371	4,073	17,024	1941
7,438	3,830	19,348	1942
7,065	3,759	20,171	1943
7,105	3,969	19,578	1944
7,442	4,625	18,457	1945
11,231	6,606	24,620	1946
13,372	7,613	29,032	1947
15,190	7,982	31,782	1948
14,570	7,651	29,038	1949
18,304†	9,561	34,176	1950
19,530	10,150	43,056	1951
19,540	10,023	43,829	1952
19,685	10,298	43,732	I
19,825	9,761	42,972	II
20,434	9,925	42,660	III '52
19,540	10,023	43,829	IV
21,967	10,432	44,551	I
21,800	10,200	45,700	II '53

Table Continued on Page 24

† Figures for this and prior dates are from another source and are not strictly comparable with later data.
‡ Beginning in 1947 tax refunds are deducted from receipts and are not included among expenditures.
→ • Annual rate seasonally adjusted. ▪ Quarterly figures seasonally adjusted. § Series revised from this date.
Quarterly figures that are significant either for their change or their lack of change from previous levels.
Second quarter figures for most series are based upon preliminary estimates and incomplete data.
Sources of the statistical series and additional information concerning the figures appear on page 27.

a record of business activity

INCOME

	11 HOURLY EARNINGS Indust. Workers *Dollars*	12 WEEKLY EARNINGS Indust. Workers *Dollars*	13 DISPOSABLE PERSONAL INCOME *Billion dollars*	14 DISPOSABLE INCOME Per Capita *1951 Dollars*	15 CORPORATE PROFITS AFTER TAXES *Billion dollars*
1914	.223	11.01	33.2	886§	1.9
1919	.477	22.08	63.5	926	5.7
1920	.555	26.30	66.8	830	3.9
1921	.514	22.18	52.8	724	0.0
1929	.566	25.03	82.5	1,045	8.4
1930	.552	23.25	73.7	965	2.5
1931	.515	20.87	63.0	914	—1.3
1932	.446†	17.05†	47.8	782	—3.4
1939	.633	23.86	70.2	1,055	5.0
1940	.661	25.20	75.7	1,117	6.4
1941	.729	29.58	92.0	1,271	9.4
1942	.853	36.65	116.7	1,417	9.4
1943	.961	43.14	132.4	1,451	10.6
1944	1.019	46.08	147.0	1,517	10.8
1945	1.023	44.39	151.1	1,492	8.5
1946	1.086	43.82	158.9	1,445	13.9
1947	1.237	49.97	169.5	1,375	18.5
1948	1.350	54.14	188.4	1,423	20.7
1949	1.401	54.92	187.2	1,407	16.3
1950	1.465	59.33	205.8	1,484	22.7
1951	1.590	64.77	225.0	1,486	20.1
1952	1.670	67.97	235.0	1,493	18.6
'52 I	1.640	66.75	228.7•	1,487•	19.7•
'52 II	1.650	66.28	231.7•	1,478•	18.0•
'52 III	1.660	67.43	236.6•	1,492•	17.5•
'52 IV	1.710	70.90	243.0•	1,528•	19.1•
'53 I	1.740	71.48	245.4•	1,539•	20.3•
'53 II	1.760	71.50 →	248.5•	1,551•	21.0•

PRODUCTION

	16 INDUSTRIAL PRODUCTION (PHYSICAL) *Index*	17 ELECTRIC POWER PRODUCTION *Billions kwh*	18 BUILDING PERMITS 120 Cities *Million $*	19 EXPENDITURES FOR PLANT & EQUIPMENT *Billion dollars*	20 GROSS NATIONAL PRODUCT *Billion dollars*
1914	61	...	735	...	38.5
1919	72	...	1,181	...	77.9
1920	75	56.6	1,256	...	85.0
1921	58	53.1	1,493	...	68.2
1929	110	116.7	2,490	9.2	103.8
1930	91	114.6	1,408	7.6	90.9
1931	75	109.4	1,006	4.7	75.9
1932	58	99.4	336	2.6	58.3
1939	109	161.3	1,029	5.2	91.3
1940	125	179.9	1,104	6.5	101.4
1941	162	208.3	1,196	8.2	126.4
1942	199	233.1	644	6.1	161.6
1943	239	267.5	419	4.5	194.3
1944	235	279.5	709	5.2	213.7
1945	203	271.3	1,028	8.7	215.2
1946	170	269.6	2,089	14.8	211.1
1947	187	307.4	2,470	20.6	233.3
1948	192	336.8	3,111	22.1	259.0
1949	176	345.6	3,131	19.3	258.2
1950	200	388.7	4,466	20.6	286.8
1951	220	432.3	3,654	25.6	329.8
1952	218	463.1	3,523	26.5	348.0
'52 I	221*	115.0	715	6.1	340.4•
'52 II	210*	110.4	952	6.8	345.1•
'52 III	212*	115.5	973	6.2	345.3•
'52 IV	233*	122.2	883	7.3	361.1•
'53 I	239*	124.8	883	6.1	363.4•
'53 II	241* →	128.7 →	1,143	7.2	368.0

FEDERAL

	30 FEDERAL RECEIPTS *Million dollars*	31 FEDERAL EXPENDITURES *Million dollars*	32 GROSS FEDERAL DEBT *Billion dollars*
1914	735	735	1.2
1919	5,152	18,515	25.5
1920	6,695	6,403	24.3
1921	5,625	5,116	24.0
1929	4,033	3,299	16.9
1930	4,178	3,440	16.2
1931	3,190	3,652	16.8
1932	2,006	4,535	19.5
1939	5,103‡	8,966‡	40.4
1940	5,265	9,183	43.0
1941	7,227	13,387	49.0
1942	12,696	34,187	72.4
1943	22,202	79,622	136.7
1944	43,892	95,315	201.0
1945	44,762	98,703	258.7
1946	40,027	60,703	269.4
1947	40,043	39,289	258.3
1948	42,211	33,791	252.3
1949	38,246	40,057	252.8
1950	37,045	40,167	257.4
1951	48,142	44,633	255.2
1952	62,129	66,145	259.1
'52 I	20,392	16,263	258.1
'52 II	17,930	18,604	259.1
'52 III	13,951	17,830	262.7
'52 IV	13,252	18,668	267.4
'53 I	21,042	17,519	264.5
'53 II	16,973 →	20,591	266.1

FINANCE

	33 CONSUMER CREDIT Outstanding *Billion Dollars*	34 LOANS OF COMMERCIAL BANKS *Billion Dollars*	35 CURRENCY OUTSIDE OF BANKS *Million $*	36 DEMAND DEPOSITS ADJUSTED *Million $*	37 TURNOVER OF DEMAND DEPOSITS *Times*
1914	...	13.2	1,533	10,082	...
1919	...	22.4	3,593	17,624	36.1
1920	...	28.1	4,105	19,616	37.3
1921	...	26.1	3,677	17,113	32.2
1929	6.4§	36.0	3,557	22,809	40.5
1930	5.8	32.0	3,605	20,967	33.8
1931	4.8	25.2	4,470	17,412	28.6
1932	3.6	20.1	4,669	15,728	23.9
1939	7.2	17.2	6,401	29,793	19.4
1940	8.4	18.8	7,325	34,945	18.6
1941	9.2	21.7	9,615	38,992	19.4
1942	6.0	19.2	13,946	48,922	18.4
1943	4.9	19.1	18,837	60,803	17.4
1944	5.1	21.6	23,505	66,930	17.3
1945	5.7	26.1	26,490	75,851	16.1
1946	8.4	31.1	26,730	83,314	16.7
1947	11.6	38.1	26,476	87,121	18.0
1948	14.4	42.5	26,079	85,520	19.2
1949	17.1	43.0	25,415	85,750	18.7
1950	20.8	52.2	25,398	92,272	20.3
1951	21.5	57.7	26,303	98,234	21.7
1952	25.7	64.3	27,500	101,100	21.5
'52 I	20.6	57.8	25,700	94,800	21.2
'52 II	22.3	59.6	26,400	95,800	21.5
'52 III	23.4	61.6	27,600	96,400	20.8
'52 IV	25.7	64.3	27,500	101,100	22.4
'53 I	25.7	65.2	26,900	97,400	22.3
'53 II	26.7 →	66.4	27,100	98,000	22.5

FAILURES

	38 BUSINESS FAILURES *Number*	39 LIABILITIES OF FAILURES *Million $*
1914	18,280	357.9
1919	6,451	113.3
1920	8,881	295.1
1921	19,652	627.4
1929	22,909	483.3
1930	26,355	668.3
1931	28,285	736.3
1932	31,822	928.3
1939	14,768	182.5
1940	13,619	166.7
1941	11,848	136.1
1942	9,405	100.8
1943	3,211	45.3
1944	1,222	31.7
1945	809	30.2
1946	1,129	67.3
1947	3,474	204.6
1948	5,250	234.6
1949	9,246	308.1
1950	9,162	248.3
1951	8,058	259.4
1952	7,611	283.3
'52 I	2,005	74.9
'52 II	2,089	71.9
'52 III	1,713	59.2
'52 IV	1,804	77.2
'53 I	2,077	81.7
'53 II	2,207	92.7

†Figures for this and prior dates are from another source and are not strictly comparable with later data.
‡Beginning in 1937 tax refunds are deducted from receipts and are not included among expenditures.
•Annual rate seasonally adjusted. *Quarterly figures seasonally adjusted. §Series revised from this date.
→ Quarterly figures that are significant either for their change or their lack of change from previous levels.
Second quarter figures for most series are based upon preliminary estimates and incomplete data.
Sources of the statistical series and additional information concerning the figures appear on page 27.

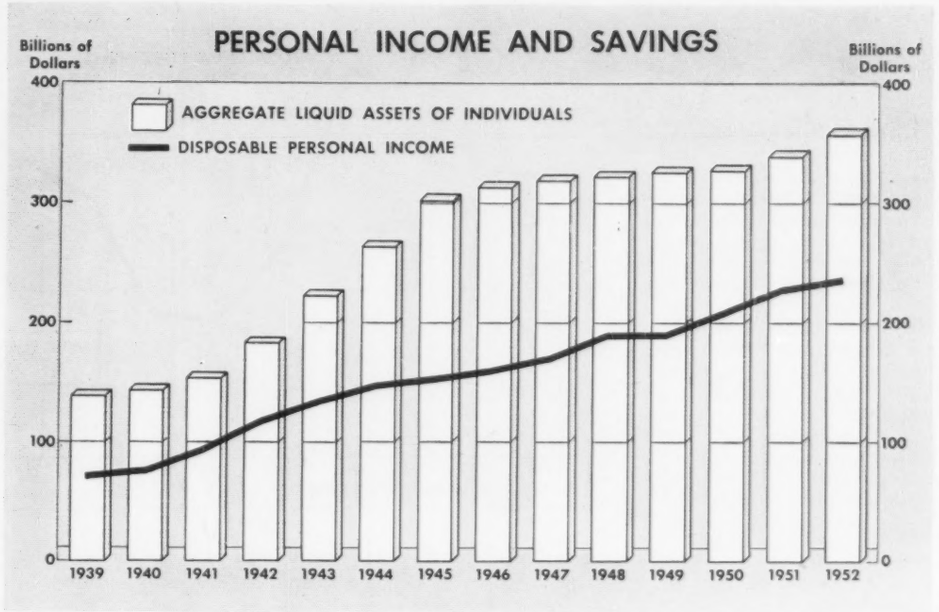
Reserve Board's recent survey of "the general financial position and economic outlook of consumers" pointed out that the proportion of consumers who thought that 1953 might be a good time for buying major durable goods, including automobiles, increased to 34 from 22 per cent between early 1952 and early 1953.

While many consumers still thought that prices were too high, those who planned to postpone buying for this reason were proportionately fewer than a year ago. Most consumers seemed to think that both their incomes and purchasing power might be higher in 1953 than in previous years. When they thought about it, eight in every ten spending units expected prices to remain stable or decline in 1953; this was one of the chief reasons given for the belief that 1953 would be a good time for buying.

Although consumers were in debt to the tune of about $75 billion ($49 billion in home mortgages and $26 billion in short-term credit) in the early part of 1953, 71 per cent of them thought that they were as well off, or better off, than a year previously when the debt level, at $64 billion was 15 per cent lower.

An advance in incomes was the most frequent explanation for feeling better off, although there was, too, a significant increase in the proportion of persons reporting a glow of security from higher savings. After-tax income was at an annual rate of about $247 billion in the first half of 1953, up 7 per cent from a year ago (Compass Point 13). Individuals held about $360 billion worth of liquid assets in the early part of 1953, of which $143 billion was cash either in pocket or in banks. Past comparisons of spendable income and liquid asset holdings are reflected in the chart on this page.

The proportion of consumers who owned no liquid assets in early 1953 declined to 29 from 31 per cent a year previously, but it was still above the low of 24 per cent in 1946, after World War II ended. While people with savings were more numerous at the War's end, the "median" saver had $750, or 5 per cent more in early 1953 than in 1946. The "median" pinpoints the middle saver; one half of the saving group has more than the median, while the other half has less. Taking into account the rise in consumers' prices since the War's end, real savings appeared to have declined; it would take roughly $880 in current dollars to match the purchasing power of 1946's middle saver's $750 nest-egg. The fifth of the spending units in the top income brackets continued to own about half of the liquid assets, according to the Federal Reserve Board's survey.



Although consumer spending has remained high, individuals have tended recently to salt away a somewhat larger portion of their increased incomes. Individuals' savings rose by $2.5 billion in the first quarter of 1953, the largest amount to be added to savings in any quarter since the end of the War. The rise was especially noticeable in holdings of Government bonds. The liquid asset holdings include cash, bank deposits, insurance, and securities. The savings figures are from the Securities and Exchange Commission, the income figures from the United States Department of Commerce.

Debtors are young . . .

. . . usually married, with small children. The idea that the high rate of family formation during and after the War was a strong stimulus to the growth of credit was supported by the survey findings. Debtors appeared to be concentrated among the younger families with middle to moderately high incomes ($3,000-$7,500).

Having smaller liquid asset holdings than the older groups, the younger spending units usually resorted to the use of credit to acquire the consumer durables necessary to the generally accepted standard of living. The income experience of the younger group encouraged them to use credit rather freely. Income increases were much more frequent among the younger spending units than the older ones in the post-war period.

While many of the indebted consumers held substantial liquid assets, the holdings of the debtor group tended to be smaller than those of the non-debtors. About one-quarter of those with debts owed an amount equal to 20 per cent or more of their incomes. Some 47 per cent of all the spending units had no debt at all.

Farmers wondered about prices . . .

. . . where does a "healthy adjustment" stop and an unhealthy slide begin? Although the volume of crops and livestock marketed by farmers in the first half of 1953 was about 5 per cent larger than a year ago, lower selling prices reduced farmers' cash receipts from marketings by about 3 per cent (Compass Point 21).

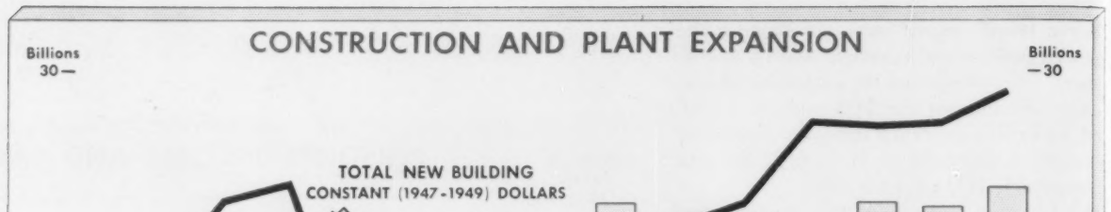
With bumper food and feed crops a probability for 1953, there seemed little reason to expect the farm price averages to recover their losses. In its July forecast, the Agriculture Department predicted that the harvest in 1953 would be the third largest on record, surpassed only in 1952 and the peak year 1948.

The corn crop is to be the second largest on record, the Southwestern drought notwithstanding. It was felt that planting and marketing controls might be necessary on the 1954 corn crop for the first time in history. The experts thought, however, that controls on corn production might be extremely difficult to enforce, since much of it is used on the farm as livestock feed, rather than shipped to the commercial markets.

Another difficulty with planting controls is that farmers, using modern equipment and improved production techniques, may be able to obtain higher yields from fewer acres, defeating the purpose behind the restrictions.

The prices paid by farmers for goods and services, including interest, taxes, and wages, in the first half of 1953 were about 3 per cent below a year ago, offsetting some of the loss in income. But farmers as a group were less satisfied with their financial position in the early part of 1953 than they were a year previously. How much this might affect their buying was difficult to assess.

With new housing starts at the rate of over 1 million a year and industrial building at a record level in the first half of 1953, it looked as though the year as a whole might see a new peak in construction activity. Expenditures for new construction were at an all-time high of $16 billion in the first six months of 1953, some 8 per cent above the year-ago comparative. Commercial construction surged upward at an even greater rate than had been expected in the Fall of 1952 when credit and materials controls were relaxed.



Although signs of slackening appeared in retail sales in some of the farm areas, spending remained above a year ago. Regional comparisons of consumer spending are reflected in the Regional Trade Barometers on page 71. Manufacturers' domestic shipments of farm machinery were at $1.7 billion in 1952, down 12 per cent from the $1.9 billion in 1951. It was hoped that the increased competition among farmers might increase the demand for modern, cost-reducing equipment in 1953.

Defense orders dipped . . .

. . . reducing the demand for machine tools at a time when the industry was expanding its plant capacity toward an all-time high. The increase in machine tool facilities was planned months ago when new orders reached a near-record volume, stimulated materially by the defense program.

Machine tool shipments in May were 4 per cent below a month ago, but 11 per cent above a year ago. For the first five months of 1953, shipments averaged 24 per cent above a year ago, while new orders were down 12 per cent. Unfilled orders amounted to 7.6 months of current production in May, compared with an average of 13.4 months in 1952 and 20.4 months in 1951.

The decline in defense orders is the principal reason for the contraction in new orders for machine tools. Bookings from manufacturers of civilian goods remained high, cushioning the effects of the defense reduction.

High Government spending . . .

. . . seemed likely for another year, even with the cut-backs proposed by the new Administration. It was thought that Government outlays would remain at the rate of about $15 billion a quarter at least until mid-1954. In addition to the current appropriation requests, amounting to almost $65 billion, there was a backlog of over $81 billion in funds appropriated but not spent, at the start of the new fiscal year on July 1, 1953.

The Government closed its books at the end of fiscal 1953 with a deficit of $9.4 billion, the largest for any peacetime period. Net budget receipts in fiscal 1953 amounted to $65.2 billion, while expenditures were $74.6 billion. Comparisons of the past income and spending of the Government are reflected in Compass Points 30 and 31.

Many officials agreed that there was a need for legislation to increase the Government's debt ceiling. The legal limit is $275 billion; the debt stands at $265.2 billion (Compass Point 32). While some observers felt that the Treasury might be able to manage through the next year without bumping the ceiling, there was little certainty that it could be done. No one was enthusiastic about the idea, but officials thought that Congress might have to be asked to raise the debt ceiling to $285 or $290 billion.

In an effort to make the deficit easier to finance, the Federal Reserve Board reduced the amount of funds that banks must keep in reserve against their demand deposits. This released an estimated $1.1 billion reserves which the banks could then either lend or invest. The resulting expansion in credit could, in theory, reach almost $6 billion. It was expected that most of the extra money so created would eventually be absorbed by the Treasury.

Tighter mortgage credit . . .

. . . resulted this Spring when the Federal Reserve Board's money policies were more stringent than now. Housing starts declined in June for the second month in a row, according to preliminary estimates.

While the May decline in housing starts was unusual for the time of year, the June dip was largely seasonal. These two monthly declines notwithstanding, June was the fourth consecutive month this year that housing starts exceeded the 100,000 unit level. The total number of new housing units put in place in the first six months of 1953 was 577,100, some 2 per cent above a year ago. While private home building was sustained well above the 1952 comparative, there was an appreciable drop in public housing.

For the rest of 1953 . . .

. . . the possibilities for a continued high level of business activity seemed to outweigh the negative aspects. Although manufacturers' order backlogs thinned out in some lines, they remained large enough, over-all to sustain high production for several months; new orders continued to be booked at an advanced rate.

While business inventories were generally above year-ago levels in the first half of 1953, sales were up correspondingly. The largest increases in inventories were usually confined to manufacturers engaged in production for defense, where heavy stocks of some materials were necessary to continuous high production. It was felt that business men would avoid increasing their inventories on a speculative basis in the coming months.

More aggressive advertising and selling programs, launched at a time when incomes were at record levels, seemed likely to stimulate buying even further. High spending was planned for the rest of 1953 by business for new plant and equipment and by the Government for the defense and other programs.

Sources of the Statistical Data

CENSUS 1. POPULATION: *U. S. Bureau of the Census,* mid-period estimates of total population including armed forces overseas—2. NUMBER OF BUSINESSES: *U. S. Office of Business Economics;* number of nonfarm business organizations under one management excluding professional practises

EMPLOYMENT 3. CIVILIAN EMPLOYMENT: *U. S. Bureau of the Census,* data prior to 1929 from *National Industrial Conference Board;* monthly averages of noninstitutional population 14 years of age and over who were at work, temporarily absent because of sickness, strike, or vacation, or with instructions to report for work within 30 days—4. AGRICULTURAL EMPLOYMENT: *U. S. Bureau of the Census,* data prior to 1929 from *National Industrial Conference Board;* monthly averages of those employed in agriculture—5. NONAGRICULTURAL EMPLOYMENT: *U. S. Bureau of the Census,* data prior to 1929 from *National Industrial Conference Board;* monthly averages of those employed outside of agriculture—6. UNEMPLOYMENT: *U. S. Bureau of the Census;* monthly averages of those not at work but looking for work, also includes those who would have sought work except for temporary illness, belief that no work existed, or waiting to return from an indefinite lay-off

PRICES 7. CONSUMERS' PRICES: *U. S. Bureau of Labor Statistics;* Revised series; average cost of some 300 goods and services purchased by moderate income families, as a per cent of the 1947-1949 level—8. RETAIL PRICES: *U. S. Office of Business Economics,* based upon data collected by other Government agencies; average prices at retail stores as a per cent of the 1935-1939 level—9. WHOLESALE PRICES: *U. S. Bureau of Labor Statistics;* average wholesale prices of some 2,000 items as a per cent of the 1947-1949 level—10. INDUSTRIAL STOCK PRICE AVERAGES: *Dow-Jones & Company;* daily average of the prices of 30 industrial stocks

INCOME 11. HOURLY EARNINGS OF INDUSTRIAL WORKERS: *U. S. Bureau of Labor Statistics;* average for production workers, reflects extra pay such as for overtime and late shift work—12. WEEKLY EARNINGS OF INDUSTRIAL WORKERS: *U. S. Bureau of Labor Statistics;* average for production workers before any payroll deductions, reflects length of work week and hourly earnings—13. DISPOSABLE PERSONAL INCOME: *U. S. Office of Business Economics;* personal income remaining after deduction of taxes and of nontax payments to government such as fines, licenses—14. DISPOSABLE INCOME PER CAPITA, 1952 DOLLARS: Compiled by dividing Series 13 by the items in Series 1 and adjusting results for changes in Consumers' Prices, Series 7—15. CORPORATE PROFITS AFTER TAXES: *U. S. Office of Business Economics;* total corporate profits after deducting all tax liabilities

PRODUCTION 16. INDUSTRIAL PRODUCTION (PHYSICAL): *Federal Reserve Board;* average physical volume of manufacturing and mining output as a per cent of the 1935-1939 level—17. ELECTRIC POWER PRODUCTION: *Federal Power Commission;* total produced by utilities and industrial establishments excluding hotels, office buildings, and other commercial establishments—18. BUILDING PERMITS, 120 CITIES: *Dun & Bradstreet, Inc.;* total value of permits issued in 120 reporting cities—19. EXPENDITURES FOR PLANT AND EQUIPMENT: *U. S. Department of Commerce and Securities & Exchange Commission;* totals for private industry excluding agriculture—20. GROSS NATIONAL PRODUCT: *U. S. Office of Business Economics;* total market value of all goods and services produced by the economy before any deductions for depreciation

SALES 21. FARM INCOME: *U. S. Bureau of Agricultural Economics;* total receipts from farm marketings, CCC loans, and Government payments—22. EXPORTS: *U. S. Bureau of the Census;* total of all merchandise—23. IMPORTS: *U. S. Bureau of the Census;* total of all merchandise—24. RETAIL SALES: *U. S. Office of Business Economics and Bureau of the Census;* data prior to 1929 from *Kuznets "National Income and Its Composition";* total sales of all retail stores—25. WHOLESALE SALES: *U. S. Office of Business Economics;* total sales of all wholesalers—26. MANUFACTURING SALES: *U. S. Office of Business Economics,* data prior to 1929 from *Kuznets "National Income and Its Composition";* total of all manufacturers' sales

INVENTORIES 27. RETAIL INVENTORIES: *U. S. Office of Business Economics;* book value at end of period—28. WHOLESALE INVENTORIES: *U. S. Office of Business Economics;* book value at end of period—29. MANUFACTURING INVENTORIES: *U. S. Office of Business Economics;* data prior to 1929 from *Kuznets "National Income and Its Composition";* book value at end of period

FEDERAL 30. FEDERAL RECEIPTS: *U. S. Treasury Department;* annual totals are for fiscal years, quarterly totals are for calendar quarters—31. FEDERAL EXPENDITURE: *U. S. Treasury Department;* annual totals are for fiscal years, quarterly totals are for calendar quarters—31. FEDERAL EXPENDITURES: *U. S. Treasury Department;* annual figures are at end of fiscal years, quarterly figures are at end of calendar quarters

FINANCE 33. CONSUMER CREDIT: *Federal Reserve Board;* total consumer credit outstanding at end of period—34. LOANS OF COMMERCIAL BANKS: *Federal Reserve Board;* volume of loans outstanding from all commercial banks at end of period—35. CURRENCY OUTSIDE OF BANKS: *Federal Reserve Board;* volume outstanding at end of period—36. DEMAND DEPOSITS ADJUSTED: *Federal Reserve Board;* total at end of period excluding interbank and Government deposits and cash items in the process of collection—37. TURNOVER OF DEMAND DEPOSITS: *Federal Reserve Board;* annual turnover rate of adjusted demand deposits

FAILURES 38. BUSINESS FAILURES: *Dun & Bradstreet, Inc.;* total number of industrial and commercial failures—39. LIABILITIES OF FAILURES: *Dun & Bradstreet, Inc.;* total current liabilities excluding long-term publicly held obligations

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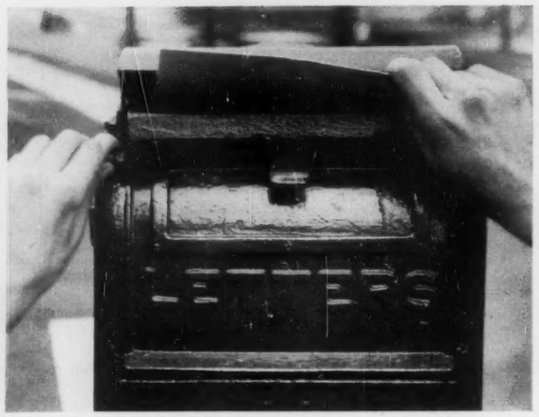


CAREW PHOTOGRAPH FROM MONKMEYER

Letters TO THE EDITOR

TARIFF THOUGHTS

Abercrombie & Fitch Co.
New York, N.Y.

Dear Sir:

Thank you very much for sending me the copy of your magazine, MODERN INDUSTRY. I read with great interest the debate in your magazine on United States Tariffs between John S. Coleman and H. Wickliffe Rose.

There are good points in both of the answers; that is for or against lowering tariffs.

After many years in the import trade, I would like to state, however, that the rates of duty in effect today are actually very low, with a few exceptions which could easily be adjusted, such as the high rates of duty on clocks, and a few others like it.

Over the last few years I cannot remember ever having turned down an offer from a foreign firm on account of high duty rates. The important decision to be made was usually the price quoted by the foreign manufacturer or the suitability of the item for the American market. The rate of duty has become more or less unimportant.

There is one situation, however, which has retarded imports and that is the valuation put on imported merchandise by the appraiser. And what is even more important, the uncertainty connected with valuation. We have cases pending now where we have to pay additional duty on merchandise imported in 1951 and 1950. The merchandise has, of course, been sold a long time ago, and we still have to pay these additional duties. The action of the appraiser can, of course, be protested. But the transaction will result in a loss, because the Customs lawyer will have to be paid anywhere from 33 to 50 per cent of the money recovered.

E. J. Heileman
Vice-President

International Business
Machines Corp.
New York, N.Y.

Dear Sir:

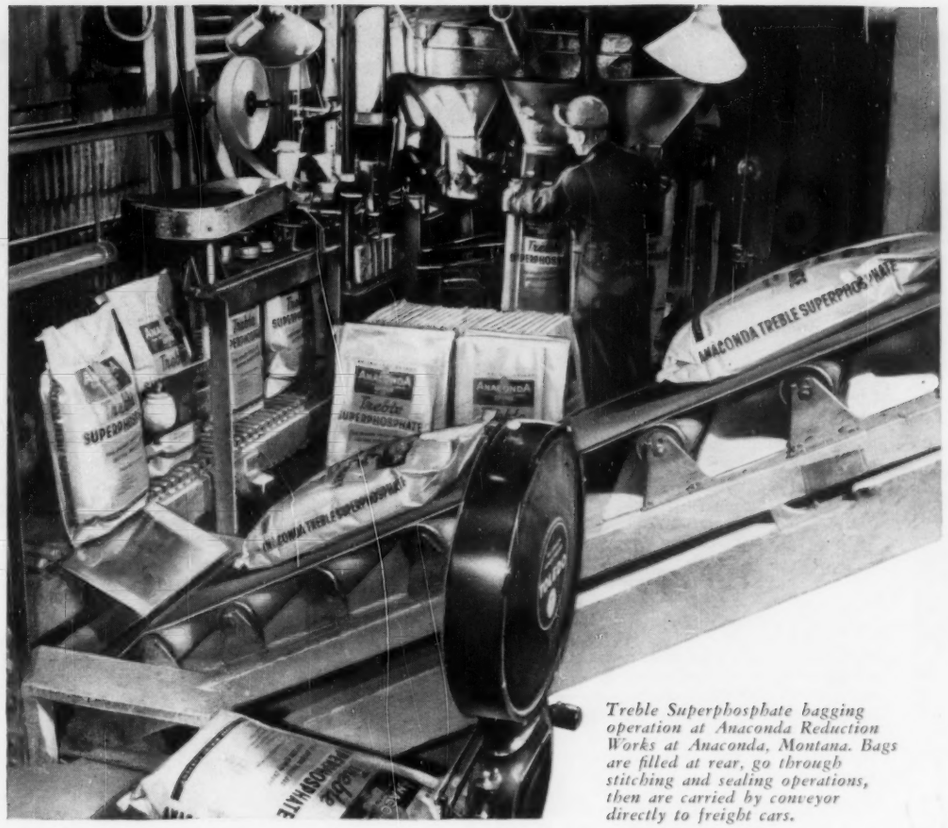
. . . It is well that this subject should receive wide and intelligent discussion. Now as never before, we must give careful thought to our foreign trade policy. In my view, we should continue the reciprocal trade agreement, seeking a fair and equitable revision of trade barriers. In this way, we will come to use the resources of the free world in an increasingly useful way, thereby contributing to the prosperity and security of the West.

Thomas J. Watson
Chairman of the Board

Sidney Blumenthal & Co., Inc.
New York, N.Y.

Dear Sir:

I always hesitate in getting into the tariff question. People who represent businesses which are especially well equipped to go into foreign fields, such as business ma-



Treble Superphosphate bagging operation at Anaconda Reduction Works at Anaconda, Montana. Bags are filled at rear, go through stitching and sealing operations, then are carried by conveyor directly to freight cars.

"ANACONDA" stands for more than metals!

A little known part of Anaconda is its production of high-strength phosphate fertilizers for Western farmers.

A plentiful supply of phosphate is vital to plant growth, a prime requisite for bountiful crops. The soils of many Western States, low in phosphates to begin with, lose more and more with each harvest. With Anaconda's Treble Superphosphate or Phosphoric Acid, farmers can easily replace this necessary chemical and substantially increase their per-acre production.

Anaconda's fertilizers are produced at the company's Reduction Works at Anaconda, Montana, from phosphate rock mined at Conda, Idaho. Containing about 42% available phosphoric acid (almost triple the amount available in ordinary low grade phosphate fertilizers) Treble Superphosphate's granular form permits easy spreading.

During 1952, Anaconda produced more than 100,000 tons of treble superphosphate and phosphoric acid. Based on numerous agricultural college and County Agents' tests conducted in the intermountain area, this production, properly applied, would increase food crops in 15 Western States by:

200,000 tons of beet sugar
300,000,000 pounds of vegetables
750,000 tons of alfalfa
4,500,000 sacks of potatoes
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Presently, a new sulphuric acid plant is being built to facilitate Anaconda's fertilizer production.

This mining and processing of phosphates is only a small part of Anaconda's operations. Producing a large family of metals for America, Anaconda is carrying on a far-flung modernization, improvement and expansion program, at mines, mills and fabricating plants. All phases of the program are directed to the same goal . . . more and better products for the country. 53274-B

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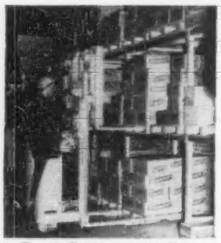
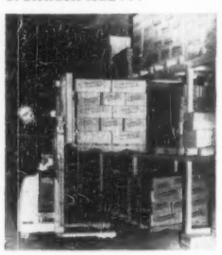


1. Reach-Fork enters pallet . . .

2. Picks up load . . .

3. Retracts load . . .



4. Lowers load for travel!

Imagine it . . . a truck that permits close-quarter operation in every warehouse in America! Only the RAYMOND Reach-Fork performs this space-making miracle. Because only the Reach-Fork has "boarding-house reach." It's another great truck from the firm that 3 years ago made 6-ft. aisles a reality!

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HANDLES ANY SIZE PALLET . . . one truck handles pallets of any size without any changes in the truck.

STACKS PALLETS CLOSELY . . . ideal for loading and unloading motor trucks and boxcars, or for rack storage use.

TIERS FROM 6-FT. AISLES in any warehouse thanks to Reach-Forks short length and patented** off-set drive wheel with 200° turning arc.

DOUBLES YOUR STORAGE by trimming 4 to 6 ft. off conventional tiering truck aisles.

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ELECTRIC INDUSTRIAL TRUCKS
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chines, are always advocates of free trade, primarily to supply dollars to buy their products.

Conversely, people who represent industries where the labor factor is an important part of their cost, and where the same machinery and techniques are internationally available, find themselves very vulnerable to free trade and naturally are against it. No one wants to be put out of business, although some people do not seem to mind if others are.

I would like to see the advocates of free trade spend a little more of their energy on increasing the living standards in these low wage countries, so once and for all we could wipe out the reason for a tariff.

A young English lady recently won a contest which provided for a trip to the United States. She was known as the No. 1 English Secretary. I saw her questioned on television. In spite of the fact that she was the English Champion Secretary, her salary was $22.40 per week. Are the advocates of free trade in favor of this? I am not.

H. H. Schell
Chairman of the Board

General Aniline & Film Corp.
New York, N.Y.

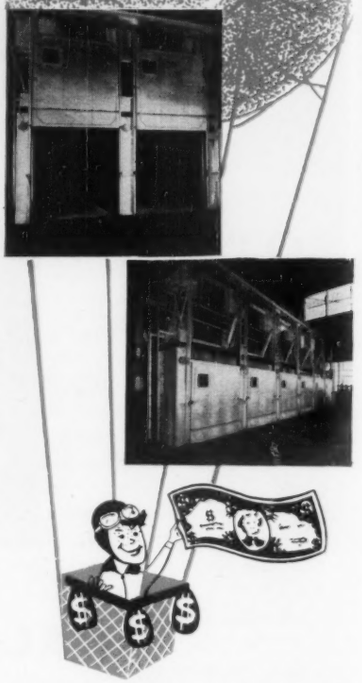
Dear Sir:

I was intensely interested in reading these two arguments just after my return from travels through eight Western European countries.

I lean to the opinion that our tariffs could be further reduced without further adversely affecting the economy of the United States, and I believe that they should be reduced as a measure of some importance in strengthening the free world. However, I differ to some extent with the authors of both arguments, because I have great doubts that anyone really knows exactly what the consequences will be at home if we reduce the tariffs or abroad if we do not. For this reason, it seems to me that the important consideration is to avoid drastic or inflexible action in either direction.

Over the past 15 years, tariffs have been gradually adjusted downward without damaging our domestic economy. As a matter of fact, during this downward tariff revision, the economy of the United

PD Raise Your "Overhead and Save"



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PD engineering experience and production ability can open "doors" for you—doors that seem closed due to inadequate facilities, space limitations, or poorly designed equipment. PD engineers can design the oven best suited to your special requirements. For more detailed information—write, wire or phone.

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DETROIT 12, MICHIGAN

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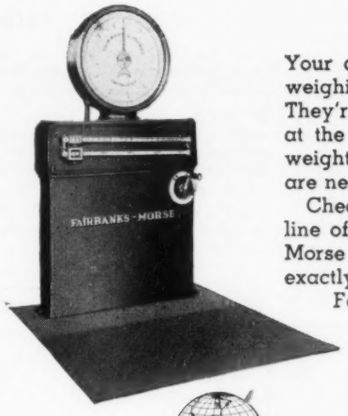

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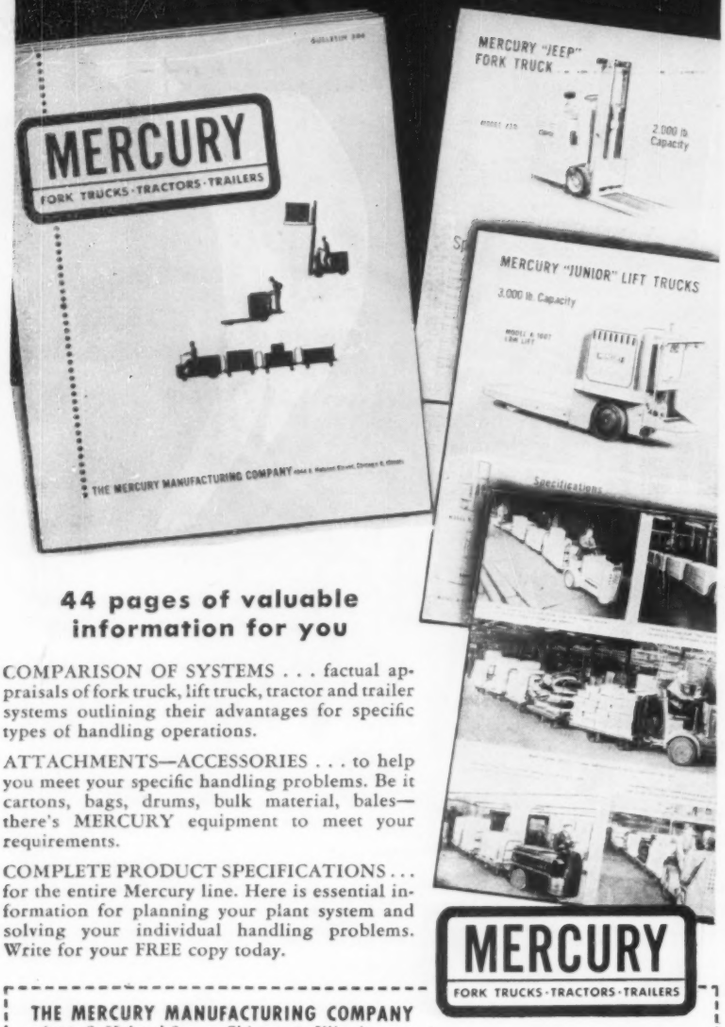

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COMPLETE PRODUCT SPECIFICATIONS . . . for the entire Mercury line. Here is essential information for planning your plant system and solving your individual handling problems. Write for your FREE copy today.

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ADDRESS_____
CITY_____ ZONE_____ STATE_____

States has followed an opposite and upward trend.

Thus it seems to me that the sensible position for the United States to-day is a cautious continuation in the future of the practises of the past, that is, further gradual downward revisions, watching the effect of these revisions and holding up further reductions where any indication of important disruption in our economy begins to appear or appears likely to begin.

In such a policy and atmosphere we shall be able to accomplish, it seems to me, both the preservation of our own sound economy and the maximum help in our own interest to our foreign friends.

John Hilldring
Vice President

FAR AND NEAR

Ministrie de l'Industrie
et de l'Energie
Paris, France

Dear Sir:

I am a Frenchman who, three years ago, visited the States as a member of an OEEC productivity team. One day, I had the pleasure to be received by a member of the staff of your nice Review who kindly took some of his time to explain the work you are doing, especially in the statistical information field. And that was of great interest to me.

When I came back to France, I received the August 1950 issue of DUN'S REVIEW and then the September one, October, November and so on. We are now in June 1953 and I have just received your May 1953 number. . . . Not one is missing from my collection.

If I write you now, it is to say first thank you, thank you very much for sending me so regularly and so kindly your Review; secondly to assure you that in doing so, you don't lose your time because your magazine is read entirely not only by me but by many of my colleagues among whom it circulates and a big diffusion of your magazine is certainly a good thing.

So don't believe that what you send me is a lost package. It's just the contrary. I receive it and try to make of it the best possible use. Once more thank you very much.

Florian La Porte

THE NEW AID TO MANAGEMENT

PROFIT ANALYSIS

HOW TO ALLOCATE, REPORT AND CONTROL

DISTRIBUTION COSTS

including a set of working papers and illustrative forms

By FREDERICK M. EISNER, B.C.S., LL.M., C.P.A.

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THIS PRACTICAL BOOK is based upon the author's 35 years' experience—14 of which were with nationally known firms of C.P.A.s and 17 years as Controller of medium-sized corporations.

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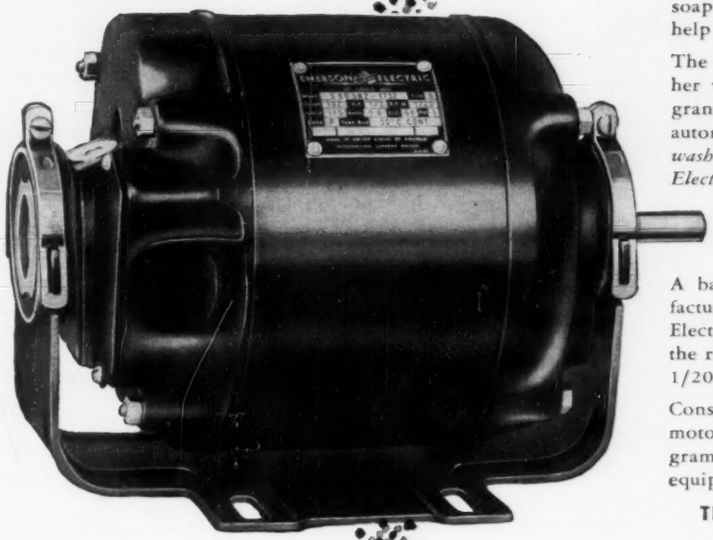
clothes come clean ... at home



"Cleaner!" "Whiter!" "Quicker!" Those sprightly soap jingles would be meaningless, without the help of the modern washing machine!

The greatest compliment a housewife pays her washing machine is that she takes it for granted. She pushes a button . . . it operates automatically. *On many of America's best known washers and driers that button starts an Emerson-Electric motor.*

A background of 63 years of motor manufacturing experience stands behind Emerson-Electric motor design and production, offering the right motor for every job, in ratings from 1/20 to 5 h.p., or hermetic motors ⅛ to 20 h.p.

Consider the advantages of Emerson-Electric motors when planning your long-range program for top-flight leadership ratings on your equipment.

THE EMERSON ELECTRIC MFG. CO.
St. Louis 21, Mo.

Write for these Emerson-Electric Motor Data Bulletins

Manufacturers requiring motors 1/20 to 5 h.p. can profitably use these reference guides. Specifications, construction and performance data are included for these motors:

- ☐ M428-A Capacitor-Start
- ☐ M428-B Split-Phase
- ☐ M428-C Integral
- ☐ M428-D Fan-Duty
- ☐ M428-E Oil-Burner
- ☐ M428-F Jet Pump
- ☐ M428 G Blower

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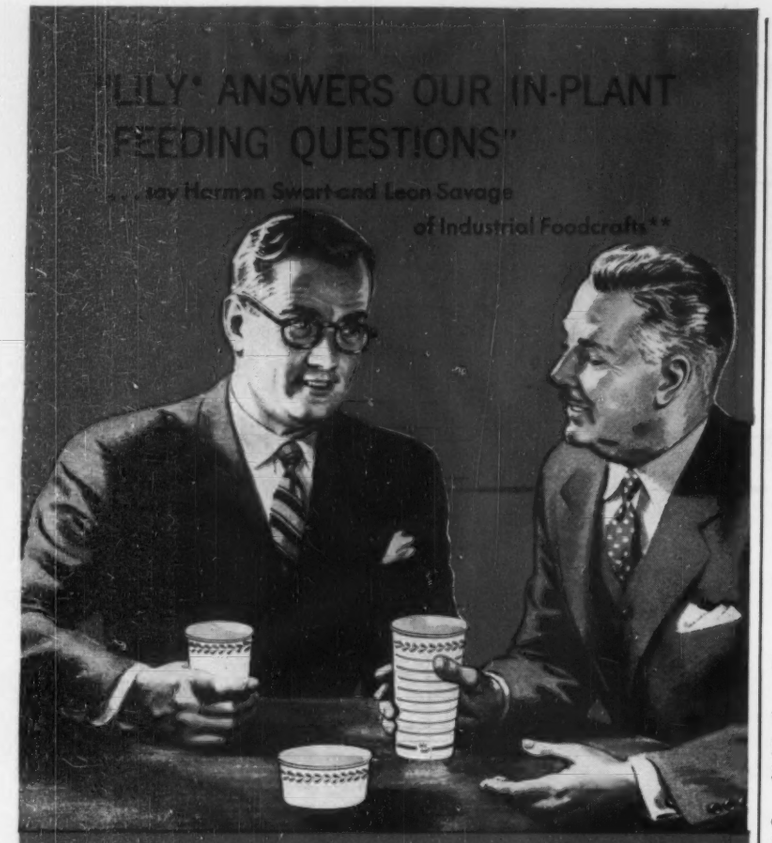
MOTORS • FANS — APPLIANCES



"Our company's business is feeding thousands of factory workers in plants from coast to coast. The big problem has always been how to do it faster, easier, and cheaper, and yet keep meals nutritionally balanced. When you consider that many workers must be fed at odd hours, over large areas, often at their machines, you can appreciate our difficulties. For this job, Lily paper service is ideal. Whether we employ mobile units, cafeterias, canteens or vending machines, Lily helps keep the business running smoothly on a professional basis."

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*T.M. Reg. U.S. Pat. Off.
**Industrial Foodcrafts, Hersh Tower, Elizabeth, N. J.

Lily® Cups

Mattel, Inc.
Los Angeles, Cal.

Dear Sir:

Sometime during the past year, I recall seeing an article in your magazine in which you listed the financial conditions existing in the various industries showing the per cent profit made by various classifications of industries. We now have need for this information but I cannot find my back copy of your magazine. I would appreciate your sending me this copy.

We have been reading your magazine with interest over the past years and have found it very useful in our business.

David Menkin
General Manager

BAROMETER BARRAGE

Ironrite, Inc.
Mt. Clemens, Mich.

Dear Sir:

In the June issue of DUN'S REVIEW, we note that you now have a pamphlet available covering the Regional Trade Barometers. . . .

We would greatly appreciate receiving a copy of this. . . . Such information plus the Compass Points of Business are most valuable in making sales analyses.

F. H. Judson
Director,
Market Research

Write Right Mfg. Co.
Chamblee, Ga.

Dear Sir:

We would be glad to receive a copy of the Regional Trade Barometers. . . . As no cost is mentioned, we assume this is a customer service, and one, we might add, which will be most helpful.

Carmen A. Dobbs
Credit Manager

Kerr Manufacturing Co.
Detroit, Mich.

Dear Sir:

In your April issue of DUN'S REVIEW, you carried an article entitled "Regional Trade Barometers." The article was interesting and we would appreciate it if you could send us two copies. . . . We would like to have any other information you might be able to forward us on this service.

H. B. Lange
Sales Manager

Attendance Awards HELP MAINTAIN PRODUCTION!

Production goals are best met when man hours lost by employees' absence are at a minimum. Attendance awards help maintain these goals by creating a feeling of personal achievement and pride in employees.

Furnished with the following information, we would be pleased to set up a program for you . . . from original designs to finished awards.

- Number of employees in your company
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INDUSTRIAL DIVISION
Emblem Manufacturers Since 1861
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It's electric! Dial like a telephone for exact lengths of gummed tape, warm-water moistened for instant seal. Any length in any sequence without pre-setting. Safer packages, yet fully 20% saving in time and tape. Savings pay for machine in a few months. Without obligation, let us prove the Dial-Taper on your own packaging.

For more information or a free demonstration mail us this ad with your name and business letterhead

MARSH Electric Dial-Taper DT-10

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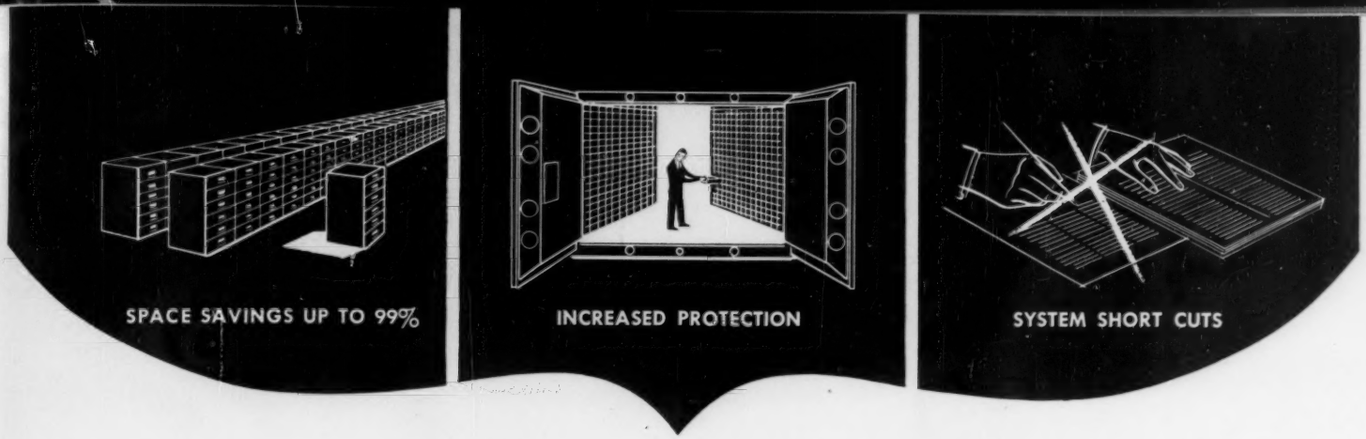

Why Recordak Microfilming gives you these advantages at lowest cost

The most important requisite in any microfilming operation is the use of a microfilmer that's geared to your company's requirements.

If your requirements are small, for example, it would be unwise to pay for a large-volume microfilmer . . . with speed and refinements which could not be used profitably in your office. Your costs would be higher . . . your dollar savings less.

Recordak, in recognizing this important fact, has created its line of microfilmers with all requirements, all budgets in mind. Whatever features you need, Recordak has. Whatever features you don't need, you needn't buy.

Thus, Recordak has made it possible for the smallest user to gain savings which are proportionate to those realized by the largest Recordak user.

It will pay you, definitely, to get complete details on the Recordak line—5 microfilmers designed for copying office-size records; and 4 models designed for copying larger documents, bound or unbound. *All available on an attractive purchase or rental basis.*

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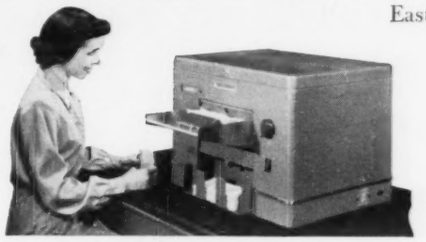

The Recordak Bantam Microfilmer, with 40 to 1 reduction ratio—highest available today.

"Recordak" is a trade-mark.

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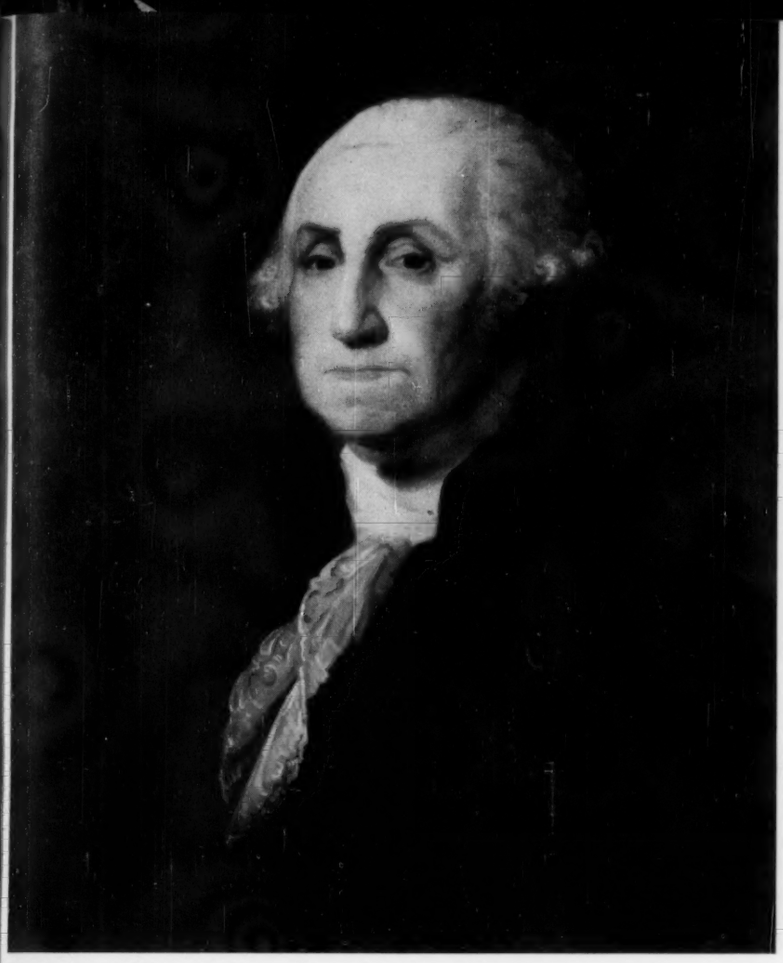


GEORGE WASHINGTON FROM A PAINTING BY GILBERT STUART IN THE POSSESSION OF A. D. WHITESIDE.

BUSINESS leadership, political wisdom, and military courage, all personified by one man, forged a unit of strength out of dissimilar elements. There was no disgrace then in being a business leader—there is even more reason for pride today. The country strengthens and prospers and top executives can take well-deserved bows, but, as business joins the professions, it may find its self-effacing anonymity a drawback in the quest for the wise, courageous, and imaginative leaders of the future.

Speaking up for Business

CRAWFORD H. GREENEWALT
President, E. I. du Pont de Nemours & Co.

CONTINUED FROM COVER 1

In this way, the modern executive came into being, and his function gained importance as the size of the business unit grew and its activities became more intricate. This happened very quickly, as history is reckoned. The executive function is very largely a Twentieth Century phenomenon, and very largely an American creation.

Unlike other professions which are older and which have held their honored position in our society for hundreds of years, we in business are, to some extent, a profession without a tradition or a past. We have no patron saint and no oath hallowed by centuries of devotion. Yet the America we know today—its high living standards, its strength, its position as a world power—would have literally been impossible to achieve without the executive function. Our living standard and our strength arise out of our ability to produce. Any production today in the required quantity, quality, and price depends on having enough competent executive talent to tie the diverse ends together and weld them into an effective machine.

The fact is that the business executive's part in our national development has been as profound—and far more lasting—than the exploits of the warriors and the makers of laws. The accomplishments of the American system are quite as much a triumph of executive skill as they are of technical development and financial venture.

In view of this it is rather a paradox that the question of who—or what—constitutes an executive is open to debate. Yet I doubt that there is any field of activity referred to so much and understood so little. The word itself suffers much through loose and rather indefinite application. Even the dictionaries don't help us much. All seem inclined to dismiss the subject with rather vague references to the executive phase of government, or by saying that an executive is "any person doing executive work." For the business executive, with whom we're principally concerned, there is scarcely a word.

The census is even less enlightening for it does not even attempt a suitable classification, although there is one which the bureau calls "managers, officials, and proprietors." In this category they list about 6,000,000 persons as "gainfully employed" and refer somewhat sadly to an additional 100,000 who are "looking for

MORNING CALM
ROCKPORT, MASS.

CAN YOU IDENTIFY THE FOLLOWING PROMINENT MEN?

Here is a short quiz designed to test your knowledge of well-publicized personages as opposed to fellow executives. Identify by profession on the left, company on the right. Answers will be found on page 90.

Marlon Brando	_____	Harry E. Humphreys, Jr.	_____
Norman Rockwell	_____	Benjamin Fairless	_____
Frederick Vinson	_____	James J. Nance	_____
Hoyt Vandenburg	_____	Keith Funston	_____
William Faulkner	_____	Eugene Holman	_____
Arthur W. Radford	_____	Walter S. Franklin	_____
Perry Como	_____	Irving W. Wilson	_____
James Doolittle	_____	John Jay Hopkins	_____
Robert Hutchins	_____	Percy J. Ebbott	_____
Walter Hagen	_____	Albert K. Chapman	_____

work." But I have great doubts that the 6,000,000 managers, officials, and proprietors are all executives in the accepted sense.

This confusion may arise in part from the fact that few people start out in life with the idea of becoming an executive. Most of us begin our careers in some specialized field—research, sales, accounting, for example—and as young men, our hopes and aspirations are bound up in the pursuit of that chosen vocation. Executive responsibility comes later in life, almost wholly as a result of the office seeking the man.

In other words, our bright young men will start as chemists, salesmen, and accountants and it is up to the present generation of executives to identify the capacities and the potential performance that will permit intelligent selection of our successors.

This is a difficult and challenging assignment and despite all the methods which have been devised to help, it remains largely an intuitive choice. What makes a good executive good? More than that, what makes an executive sure that this candidate has an edge on that; that A's chances of success are better than B's?

Talent in other fields of endeavor can be recognized quickly and readily. We have only to listen to a pianist, examine the work of an artist, or observe an actress on the stage to determine whether or not they are good. In other fields there are recognized standards to aid judgment; a lawyer must have passed a bar examination, a surgeon can refer you to his diploma from the American College, a ballplayer can point to his batting average. Among executives we can only recognize competence after long periods of observation and even then there may be large differences of opinion.

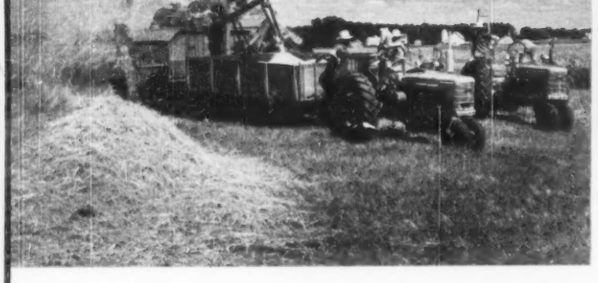
How difficult it is to appraise potential in advance! It seems to me that the attributes that make a successful executive are found more than anywhere else in the intangibles. A job analysis, useful enough in other areas, falls down completely in appraising executive potential. The more I think about it the more I am impressed by the fact that in the executive area there is no fixed procedure, no precise pattern, no yardstick of performance that can be counted and measured.

Some say that the essential quality is leadership, and I have no doubt that that is, in

Continued on page 80

From the rich farmlands of the prairies, the lonely grazing grounds of the West, and the dusty streets of the city, comes the raw material to make to-morrow's executives. Ability is continually seeking opportunity, but opportunity must knock loud enough to be heard.

CUSHING PHOTOGRAPHS



DEVANEY PHOTOGRAPH

The case for MOBILIZATION PREPAREDNESS

MELVIN ANSHEN

Professor, Graduate School of Industrial Administration
Carnegie Institute of Technology

THE BUILD-UP stage of the defense program has been substantially completed. Most of the critical production problems have been solved. Our capacity to produce has been vastly increased. Shortages of strategic raw materials have been reduced or eliminated. The nation's economy can now supply both the needs of the military in the cold war period and the demands of our fully employed civilian economy.

In these circumstances the Government is moving rapidly to turn back to private business responsibility for deciding what should be produced, where it should be produced, and in what quantity. There is every reason to anticipate that only the outbreak of full-scale war will again make it necessary to substitute Government for private decision-making in the area of production and the distribution of materials.

The integrated military and economic policy to which we are committed in the "cold war" world contemplates the maintenance of a continuing state of mobilization readiness concurrently with the free functioning of private business. The essential assumptions that underwrite this policy are easily grasped.

DEVANEY PHOTOGRAPH

MOBILIZATION has an ominous ring about it at the best of times. Yet, with two World Wars past, Korea still in a state of flux, and an alarming powder-keg present, to-day is the best time for preparation. To avoid the errors and delays of past mobilizations, a smooth-working Government-business policy must be ready to fuse men and machines into a highly efficient production apparatus.

Assumption One: Our expanded production resources are equal to the demands that will be placed against them under full mobilization.

Assumption Two: In an emergency these resources can be converted rapidly from peace to war assignments. If these assumptions are not sound, serious questions are raised about the real nature of our mobilization readiness.

On the basis of a review of the Government's administrative tools for directing the mobilization of resources in a national emergency, this article concludes that we are not as ready as many of us think. We have enlarged our economic potential. But we are not prepared to use these resources efficiently and effectively in an emergency.

We are not prepared because the control machinery—the procedures used for directing the flow and use of critical materials—cannot be installed and brought into effective operation promptly. Unless industry and Government take co-operative action now to remedy the defects in the control machinery, the national security will be seriously endangered despite the enormous investment that has been made to strengthen the mobilization base in

material and energy resources and in production capacity. In this critical segment of the security program, private industry can make an important contribution that will prevent the recent additions to material resources and productive capacity from being weakened by our inability to assure a rapid mobilization of industrial potential in the event of need.

This article suggests ways in which the control machinery can be adapted to the normal peacetime procedures of industry. It urges the importance of a co-operative business-Government effort to modify the control structure so that industry can operate free from restrictions in time of peace without endangering our ability to mobilize our resources on short notice with no time lost.

It is critically important for business managers and Government administrators to recognize (1) the extent to which the national security depends on rapid and efficient mobilization of economic resources; (2) the extent to which inefficient economic mobilization accumulates costs in terms of wasted materials, production delays, idle resources, and frustration and harassment of business management; (3) the kinds of action that can be taken now to avoid these costs and risks; and (4) the negligible expense and minimum disturbance to established procedures that will accompany such action.

Decontrol Implications

When materials shortages disappear, the obvious course of action is for the Government to relax and abandon its controls over production, construction, and the distribution of materials. This dismantling of the Government's control machinery terminates the requirements imposed on industry for reporting material consumption and product output. In the normal course of events, this is followed by a curtailment in the type of industrial record-keeping needed to provide information essential for centralized administration of the defense production program.

These actions are in prospect at a time when every one knows that the national peril has not substantially diminished. We contemplate a cold war that may endure for a decade or a generation while the world adjusts to a new balance of power. We admit that the cold war may turn hot at any moment and without warning. We continue to make large appropriations for munitions. We are developing military plans, installations, and weapons to give us at least partial protection against surprise attack, and to add to our capacity for striking back hard and fast.

Our growing strength in bases, detection devices, and weapons provides a gratifying, although limited, insurance policy. But against the record of the time required to convert from peace to war production in 1942 and again in 1950—and the fact that we may have no shield of allies to give us arming time in any future emergency—answers are urgently needed for some critical questions.

Civilian production lines were not finally halted until many months after Pearl Harbor, and peak output of military goods was not attained until late in 1943. Experience in controlling the distribution of materials in 1950 and 1951 to reach limited military objectives once again illustrated the difficulties associated with converting production from peacetime aims to defense goals.

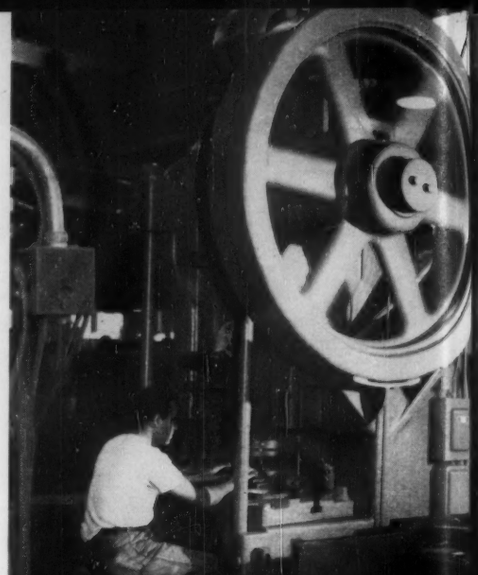
Why did it take us so long to arm in 1942? Why did comparable delay occur after the invasion of South Korea? Is there anything that can be done now to prevent such a delay in any future emergency? To what extent have we assured the nation's security by enlarging our military forces and their stock of weapons, and by expanding our capacity to produce raw materials and munitions items? Are there other important ingredients of a security program to which attention should be directed? Is there any way to telescope the period of transition from peace to war production? Above all, is a state of mobilization readiness compatible with an economy in which private business is relatively free from controls over production?

Study of our mobilization experience in the Second World War suggests that the most difficult administrative problems dealt with by the top staff of the War Production Board were matters of procedure and not of policy. The basic policy issues were clear beyond debate. The nation's production resources were to be organized to get the greatest possible output of military goods in the shortest possible time. Under the most favorable conditions, of course, conversion from civilian to military production cannot be accomplished faster than production facilities can be physically organized to handle new assignments, including removing old production lines and tooling new ones.

Delaying Causes

But the time actually required to build to peak military output was substantially longer than this engineering and production turnaround period. Two important causes of the delay—and the accompanying waste of materials, labor, and equipment—were (1) lack of knowledge about the material and component requirements of proposed military and defense-supporting production and construction programs; and (2) the absence of control procedures in business and Government ready to translate policy decisions into accomplishments.

Lacking reliable information on material and component requirements, Government administrators could not make sensible decisions about the feasible size of military production and construction programs, or about the appropriate balance among direct military and defense-supporting programs, or even about levels of component deliveries required to support specific end-item production schedules. In the absence of control procedures, whatever program decisions were made had little better than an accidental chance of being carried out.



DEVANEY PHOTOGRAPH

A review of a series of program and material decisions made by the War Production Board Requirements Committee early in the Spring of 1942 concluded that most of the decisions of this top-level policy committee were never translated into action. A decision to assign a specified tonnage of steel to a specified Navy production program, for example, would be transmitted to the appropriate official in the WPB Steel Division. But this individual had no control tool at his disposal that would help him to identify and speed delivery on the thousands of purchase orders placed by companies trying to buy steel to carry out their schedules under Navy contracts—and, even more important, subcontracts.

Why were the essential facts for mobilizing industrial resources lacking in a nation whose devotion to the compilation and publication of statistics is without parallel in the world? The answer can be found in the distinction between the kind of facts that are useful for the peacetime economy and the kind that are needed for centralized administration of the economy in time of war. The statistical information normally collected in this country is oriented toward its use in profit-motivated firms making individual decisions for survival and gain. As a compiler of statistics, the Government is largely concerned with measuring the results of millions of private decisions by hundreds of thousands of companies.

Data on business activity provide a good illustration. Statistics on retail sales and inventories are used by business concerns at all levels of manufacturing and distribution in framing decisions based on projections of current market conditions. The Government has an interest in the same categories of facts as indicators of the state of the nation's economic health.

But in time of war, when the nation's resources must be managed for survival in a hostile world, prices and profits cannot be allowed to determine who gets materials, what

is produced, and who purchases the output of factories. Administrative decisions are not based on projections of current market conditions. They are framed with reference to criteria outside the price-profit complex and they are concerned with assessments of resource utilization. The peacetime patterns of production and distribution must be changed. Decisions on the nature and the timing of the change, however, cannot be made without knowledge of the kinds, quantities, and delivery schedules of materials and components required to secure specified kinds, quantities, and delivery schedules of end-products.

Even in the early days of the defense build-up in the Second World War, a great debate raged over the issue of whether there was enough steel, enough aluminum, enough sulphur to support a guns and butter program. Later, the debate continued unabated over the maximum feasible program of guns without butter. In the early period, many of the civilian mobilizers believed that the country could support a much higher level of military production than was proposed by the services, and urged rapid expansion of munitions output. Then the pendulum swung the other way. By late 1942 the military services were proposing output levels for munitions items that the civilian mobilizers were convinced could not be attained.

DEVANEY PHOTOGRAPH

"Arms and the man" no longer pertains just to the soldier and his weapons. To-day the call goes out to the civilian and his weapons, the lathe and the punch-press. Men and women of all ages must work around the clock supplying the ingredients for the all-out effort.

At least one of the reasons why the debate continued so long and the pendulum swung through so wide an arc was that the participants were not in a position to translate with reasonable accuracy the military's end-item schedules into their related demands on material resources. No one had precise knowledge about the material requirements to support any proposed aggregate military program; the material requirements to carry out related defense-supporting programs in such areas as power, petroleum, and transportation; or the material requirements for maintaining a healthy civilian economy.

The peacetime economy never needed such information. Very sensibly, therefore, it never collected the information. Nor could the Government in wartime proceed to get the information promptly. The facts had to come from manufacturing industry, and industry could not report information not available from its own records.

The War Production Board found that it took three years—from 1940 to 1943—to build up a flow of statistics that would even partially satisfy the need for facts for decision-making. During this period, when the nation's resources were being mobilized, when production and raw material capacity were being expanded, when civilian production was brought to a halt, and when military output was stimulated, shockingly few decisions were based on solid facts. The decisions to alter production patterns and the flow of materials were made because they had to be made. In the absence of knowledge, the surprising thing is that the mistakes and the wastes were not greater and that the delay in reaching production potentials was not longer.

This comment should not be read as critical of the failure of the military services to develop reliable procedures for translating delivery schedules for tanks, planes, ships, and weapons into quantitative and time-phased requirements for steel, copper, aluminum, nickel, fractional horsepower motors, valves, and other components. The assignment is one of almost incredible complexity. But beyond that, nothing in the peacetime history of the United States has called on the Federal Government to put itself in a position to provide this information. Neither has there been occasion to collect the related essential information on bedrock civilian requirements in a mobilized economy.

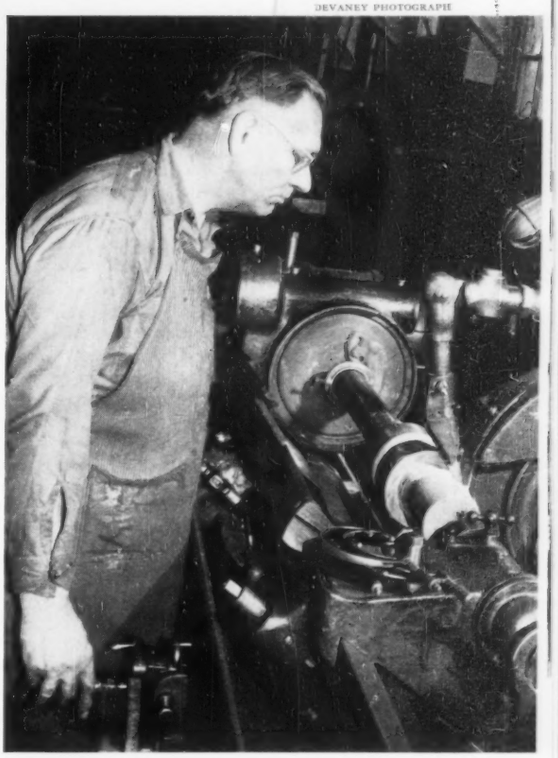
It is probably fair to add that in the environment that prevailed before the attack on Pearl Harbor any attempt by the Government to collect this kind of information and to impose on industry the necessary record-keeping and reporting would have been viewed with deep suspicion and would have been stubbornly resisted as unwarranted prying into private affairs and costly statistical boondoggling.

The operating history of the Controlled Materials Plan in 1951 again illustrated the confusion and delay that attend the introduction of a comprehensive control procedure in the absence of the kind of requirements information required for intelligent allocation decisions. More than a year elapsed after the decision to introduce a comprehensive control before the system could be brought to a reasonable level of operating efficiency. During this year there was no systematic administrative direction of the use of materials.

The extent to which the achievement of the limited military and related production and construction objectives was delayed cannot be pre-

Continued on page 143

DEVANEY PHOTOGRAPH



Streamlining the SALES FORECAST

Budgets, inventory buying, production scheduling, labor requirements—all hinge on a bull's-eye sales forecast. Here's how companies organize to get one.

AN ACCURATE forecast commands more of a premium to-day than at almost any time during the last fifteen years. It's a rare product that still operates in a seller's market. During the 1940's a forecaster's job was mainly one of determining capacities and estimating availability of labor and supplies. Now, with the emphasis shifting from "How much can we make," to "How much can we sell," a reasonably accurate sales forecast is a must.

Statistical sources and techniques have expanded and been refined over the past twenty years but, even so, few forecasters worth their salt disagree with the American Management Association's description of forecasting as "guessing what the public guesses concerning the future, about which we have no evidence; and even though the public may guess wrong and act accordingly, our job is to detect these wrong answers, even though we ourselves may be right."

This type of uncertainty is a constant occupational hazard in forecasting. Although it cannot be avoided entirely, many companies find that the range of error can be narrowed by broadening the forecasting apparatus to include more departments within the company and by using up-to-date methods.

One of the most significant developments in sales forecasting is the increasing use of statistics. In fact, some companies (see Dow Chemical, page 43) now by-pass the traditional salesmen's estimate entirely, although the more frequent procedure is to incorporate the field estimates into the final pattern. An early entrant into the statistical arena was Eastman Kodak where a centralized statistical department was set up just after World War I. One of their first discoveries: Just segregating sales data so that results are related to particular markets or market factors is half the battle in making decisions about the proper forecast to use.

The complicated techniques used at Kodak boil down to this: First, the staff prepares a forecast of general business conditions—they prefer to call it an "assumption about the future."

Then, they project or extrapolate from current sales levels for major products in line with their assumptions. At this stage they take into account every conceivable factor, internal and external, that might influence sales. Among them: production capacities, upcoming changes in costs and prices, new markets, technological changes, competition, and special promotional plans.

Kodak shies away from a standardized approach to general business forecasts. The forecast the statisticians ultimately present to management is stated concretely in terms of GNP, the FRB production index, BLS wholesale and consumer price indexes, department store sales, and disposable income. But the assumptions upon which these projections are based range from a complicated system of analysis of predictive series such as that made by the National Bureau of Economic Research to, simply, the opinion of experts.

Statisticians at Eastman Kodak and elsewhere admit that there is no easy way to combine mechanically different types of analyses into a neat and tidy forecast. It's equally difficult whether you are estimating levels of output or the timing of changes in the business cycle.

As a result, the forecast that finally leaves the department is based on much more than statistical research. It develops like this: After preparing a tentative basic economic conditions forecast, statisticians sit down with management and work out agreement on the most likely course of events. These assumptions are then distributed to all management people who will have to work from the forecast when it appears in the form of budgets.

Then the statistical department extrapolates sales trends for each product in terms of dollars and quantities. Now that the forecast is beginning to jell, but before it is completely molded, it is exposed to a series of meetings. The majority of conferences are held with sales executives but staff personnel related to production, advertising, research, costs, and pricing also get a chance to swing at it. One by one the forecast for individual products is discussed and the original projections are changed to absorb the special information developed in these sessions. Finally,

Good forecasters use these primary sources

Literally thousands of specialists work on an efficient sales forecast. The seemingly endless resources of Federal departments are tapped; publications of private organizations are pored over; and professional meetings are drained dry. Below are some basic reservoirs.

Government

Bureau of the Budget
Department of Labor, Bureau of Labor Statistics (many publications, key source)
Securities & Exchange Commission
Federal Reserve Board ("Bulletin")
Bureau of the Census (population trends, manufacturing data)
Department of Defense (obligations)
Bureau of Mines (basic production data)
Department of Commerce ("Survey of Current Business")
Bureau of Agricultural Economics
Federal Power Commission

Private Research Organizations

Brookings Institution
Twentieth Century Fund
National Bureau of Economic Research
National Industrial Conference Board
Research Institute of America

Trade Associations

Important industry data available in various publications. Many associations actively cooperate with members in assembling special information.

Trade Publications

Many of the so-called vertical industry magazines publish valuable production and price data. "Iron Age," for example, prints extensive price, operating and marketing information.
Regional analyses published by Federal Reserve district banks, and monthly letters printed by private banks provide valuable interpretation.

Professional Associations

American Marketing Association
American Economic Association
American Statistical Association

this version goes to a Finished Product Committee including several vice-presidents which either passes it or makes additional modifications. Now the forecast is ready for management use in planning budgets and scheduling operations.

Because extensive use of forecasts is relatively new, most companies find themselves still evolving their programs. A prime example of this is going on at the Electric Storage Battery Company in Philadelphia. The current technique produces two forecasts which are converted into a single estimate. The new package will use three.

The first forecast is made by the field salesmen and then modified by the product managers and sales vice-president ("Charley in Toledo is always optimistic. Let's drop his estimate 10 per cent"). The second forecast is prepared by the company's marketing research expert and economist on the basis of historical series on all product lines and industry sales, plus a reading of future conditions in those industries where the company's products are merchandised.

Supplementing these, however, Exide is considering now a system of market survey techniques based on a carefully adjusted sampling procedure. Industrial battery sales, the company finds, are often dependent upon the intentions of a fairly small number of industrial customers. It estimates that in many of its lines, up to 80 per cent of annual sales can be anticipated by means of surveys accurately reflecting future orders to be placed by these few companies.

Each of the forecasts will be prepared independently. When they are completed, Exide will hold a meeting at which the predictions will be appraised, modified, and compromised. Then the economists will work them over and come up with revisions based on the over-all outlook and cyclical or secular trends in major consuming industries.

Exide goes along with many other companies in its belief that forecasts should be prepared originally without an assist from other departments preparing their own forecasts. Their economist reports on conditions to top management on alternate months, but he makes no formal report to market research or sales. They are on their own as is he. In this manner, three points of view based on three different types of data come to the conference table, but the final version must satisfy everyone. "Believe me," says economist Havens, "sometimes that takes plenty of compromise."

Not all concerns require an elaborate forecasting apparatus. Take small Newark Gear, Inc., in New Jersey, for example. The firm has almost tripled its gross sales in the past three years, but its forecasting activity is almost nonexistent. Reason? It doesn't need it. A small routine operation will fill the bill. Here's why: Few of its products become standard shelf items; few are inventoried. A vast majority of the company's products are built to order with a fairly long production cycle. Consequently, except for small quantities of bar stock, the company car-

CASE STUDY

At Dow Chemical
salesmen just sell!

Management at Dow Chemical Company deemphasized forecasting by their salesmen about three years ago. Although salesmen provide some "field estimates," says a Dow executive, "A good salesman is not a good forecaster and a good forecaster is not a good salesman." As the top echelon sees it, "A good salesman must be optimistic and you can't be both an optimist and objective."

Complicating the forecasting problem for Dow is the fact that over 300 different products sold to industries of vastly different functions must be estimated sufficiently in advance to allow for raw material purchases and production scheduling. The techniques they've evolved to date depend heavily on specialists who know the product and the major industry customers. Here's how it works:

The procedure is kicked off by the sales forecasting section of the Market Research Group. They prepare a series of forms showing past sales and past forecasts on each of the 300 products. These worksheets are distributed to product specialists. These executives, under a group supervisor, handle the product from a sales angle.

The product specialist forecasts sales by looking at past sales and then making projections. The projections take into account the status of the current market, new developments, general business and individual customer activity. For example, they relate past Dow sales to past national sales of the product and calculate changes in the Dow percentages to the national percentage.

When the specialist finishes the forecast, he shoots the worksheet upstairs to the group supervisor. He checks them to make sure they are realistic. If, for instance, he thinks an upcoming ad campaign may produce more sales than the forecast allows for, he and the specialist check their assumptions together.

Key Man in Operation

In many respects the product group supervisor is the key man in Dow sales forecasting. His main job is the management of the sales aspect of the products under his control. In a sense, he is a sales manager for those products. General sales managers are concerned with over-all policies and usually a few specific broad problems. By contrast the product group supervisor worries about the day-to-day sales of his products by the field sales force located in branch offices.

When the product supervisor OK's the sales estimate, he ships the worksheet back to the forecasters in Market Research. Here, all of the group forecasts are reconciled and consolidated. Unlike the set-up in many companies (see SKF, next page) Dow's market research people prepare no separate forecast. Their job is solely one of combining separate product estimates into a sensible over-all picture. They sometimes find themselves in the often embarrassing position of, after having reconciled all of the supervisors' estimates, still popping up with sales totals which are unrealistic on a company-wide basis. When this happens, market research makes an effort to juggle the totals into line.

But the review of the raw forecasts is not finished even yet. Now it is co-ordinated. Copies of the estimates are sent to Production Engineering and to Sales Management. Production Engineering, whose job is production scheduling, has a staff relationship to the Production Department. Estimates are reviewed here and questionable ones from a scheduling angle are checked back with the product supervisors and worked out.

Last Lap in the Race

Then Production Engineering prepares the schedules and sits down with Sales Management (who have also received copies of the forecast) to check the production schedule to make sure that sales and production plans will dovetail. After these sessions, production units in the plants get the schedules where they become the production figures for the ensuing months. And, finally, the sales forecasting information is presented to the general management.

In other words, the product and total forecasts filter through most of the key departments for refinement before acceptance.

Despite the apparent efficiency of this system, Dow plans revisions to get still greater accuracy. As one forecaster points out, a hundred poor estimates are not as worth while as a single forecast that hits the mark. Because so much hinges on the judgment of the product group supervisor (who initials the original forecast), the market research group is developing a series of charts which will be used to point out economic changes generally and in the chemical-consuming industries.

Before the supervisor plots his course he will be briefed on these general indicators as well as on output by pounds, tons, or gallons of the company's industrial clients. Still another device Dow is exploring to sharpen their forecasting is to show the supervisors precisely how they got off base in the past.

Because the company uses the basic sales forecast in practically every phase of its operations, Dow estimates and revises about as often as is practical. Through the mill go short-term forecasts (one year or less ahead) eight times a year and one 5-year forecast each year.

Whenever it is found necessary to change a forecast, a red change sheet is initiated by the product specialist, passed by the group supervisor and shot through Product Engineering to Production to signal a quick shift in schedule. In this manner production can be adjusted fast to prevent an overloading of supplies or a shortage against sales.

ries little inventory except work in process. Material purchases follow receipt of new orders. And the backlog has been over six months for some years.

The president and the treasurer keep track of national figures on shipments, new orders, and cancellations and relate these to the concern's performance but, because of the capacity and backlog situation, forecasts are not needed. Material from the National Machine Tool Builders' Association, the Materials and Allied Products Institute, and the American Gear Manufacturers' Association provides entirely adequate information about industry conditions.

Practical Tips on Forecasts

However, for companies not in this enviable position, here are a few tips on the organization of and the use of sales forecasts:

- Make sure that your system is not hidebound. New statistical techniques, better sources of data and more contacts are around. Remember, it's cheaper to duplicate data than it is to base output and purchases on a forecast that left something out.

- If you are a small concern, without an organized program, use your departments plus outside sources. Get the cost estimates from purchasing, major accounts' buying intentions from the sales staff, the money-market picture from the treasurer. Base your estimate of broad conditions on analyses in the trade and financial press, on reports in bank letters and Government publications similar to the *Survey of Current Business*. Check your association and its publications for specific industry information.

- Make certain there is a close working relationship between sales and advertising, the economic or statistical staff, production planners, and the financial departments. First, all will have to implement the forecast eventually and they should, therefore, have a prior opportunity to question its assumptions. Second, they may have a line on something that escaped you. For example, in a company with a relatively few major customers who may absorb 75 to 90 per cent of sales of a product, prospective entry or loss of an account can make an enormous difference in terms of scheduling machine time and purchasing. But only the district sales manager may know the latest news.

- Use every available source of information. Insist that your economists and statisticians be "joiners." A lot of important advice is touted at professional meetings, opinions that are never printed.

- Insist that the finished forecast be clear and precise, easily understood and susceptible to only one interpretation by staff and operating management.

- USE IT.

Here's how SKF

Close liaison among three departments spreads coverage, narrows loopholes, builds accuracy.

District sales managers, the "home office," and a commercial research staff mesh gears about the end of October to turn out an efficient and reasonably accurate sales forecast for SKF management. By January 1, the forecast is ready for executive action.

SKF must plan ahead from four to nine months. Unless the planning is fairly accurate, it runs into inventory or production problems. Without a sound, dependable forecast the company would have to be unhumanly fast on its feet, ready at a moment's notice to speed up production cycles, or else be prepared to carry an expensive inventory. The system has evolved into an organization which in effect tests three types of forecasts against each other before coming up with a final, composite estimate. During the process of justifying, reconciling, and defending, most of the kinks are ironed out.

An important figure in the SKF landscape is their sales manager. As the chart at right shows, the three streams of material initially flow to him and through him to the vice-president in charge of sales. In the forecasting area, however, the sales manager is more than an animated traffic light. His function is one of preliminary analysis. Each of the three forecasts must be checked for internal logic. In other words, he tries to ascertain whether or not the basic assumptions are probable—in forecasting, few experts ask more than this.

After analyzing the individual estimates, the sales manager usually proposes a single sales figure. This, as well as the original three, goes to the sales vice-president who makes an equally extensive check and revises before the forecast becomes official.

Behind the final estimate lies a chain of conferences with the sources of the original forecasts—Home Office Sales, District Sales Managers, and Commercial Research. Because each department has a different point of view, reconciling the three is a vital and sometimes delicate step. For example, the Commercial Research staff prepares its forecasts on the basis of general and often aggregative material such as projections of the FRB production index of durable goods. On the other hand, the district managers receive and combine estimates from the sales force which are based on actual contacts with salesmen's clients. Because the approaches are so different, the final estimates are bound to differ.

SKF's management puts it this way: One forecast may assume that a customer industry is about to liquidate inventory and another forecast may assume steady purchases. Or the Sales Department may assume that the company will gain a larger percentage share of the market than the analysts in Commercial Research think probable. Or the sales specialists may know that sales of a particular product will boom because a number of major potential customers are about to become actual buyers. But back in Home Office Sales, people preparing *their* forecast may be unaware of that new bloc of customers.

All of these differences in approach and background knowledge are taken into account and smoothed out in conference among the sales vice-president and the department managers responsible for the individual forecasts before the final estimate is formed.

Here's how individual forecasts shape up:

Sales forecasts by District Managers: From their salesmen, the managers receive an estimate in terms of major accounts and sometimes by major product lines as well. The salesmen pick up this material quite informally from contacts with their customers.

The final district figures are an amalgam of what the clients say they expect and what the district manager, on the basis of past experience, thinks will happen. Managers ask for considerable detail from the salesmen, but what actually comes into the office depends, naturally enough, both on the salesman and his client.

Forecast by Home Office Sales: This area includes the six departments on the diagram (right), each of which forecasts total SKF sales by industry.

Industry specialists in Home Office Sales are pretty much in the middle between the statistical analysts in Commercial Research and the ear-to-the-ground techniques used in the district estimates. They are in close contact with district managers. They use many of the services of Commercial Research. And they have at their fingertips industry production, inventory, and backlog data. In addition, they pay close attention to industrial information in the trade press.

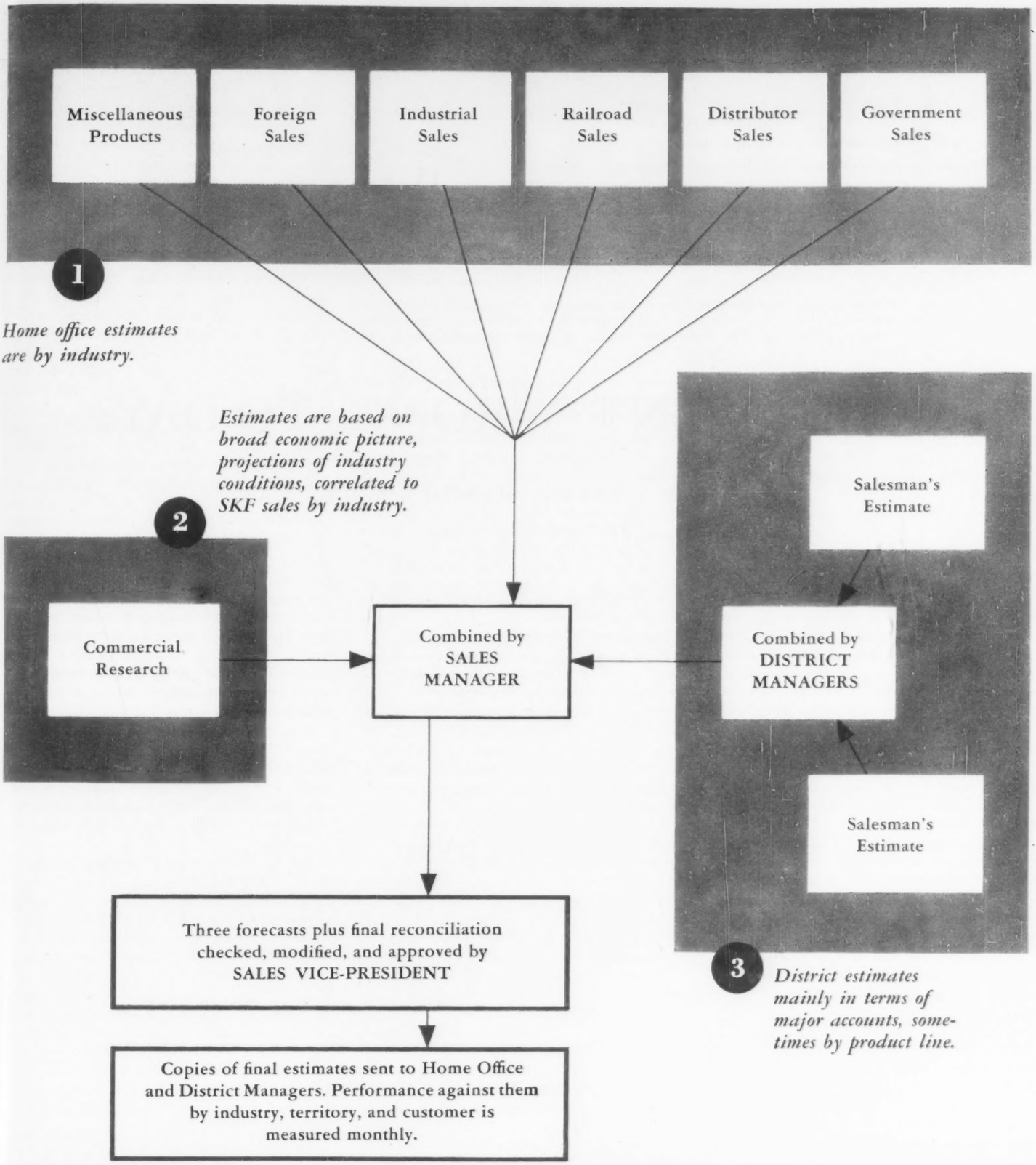
Commercial Research forecasts: Two preliminary forecasts furnish the grist for the final estimates. One is a projection of general business conditions and the translation of this into an estimate of total antifriction bearing industry sales, together with an estimate of total SKF sales; and the other, a projection of conditions in major industries to whom the company sells and a summation of the resultant sales by industry.

These two groups are compared and reconciled within the department. Then they are converted into estimates by territory.

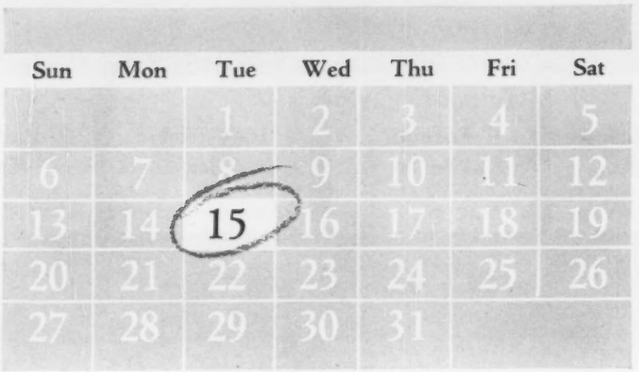
Every available source is combed to make the sales picture as complete as possible. Government is a major supplier of data. Trade associations furnish valuable new order and backlog material. Industry contacts fill in many gaps when material is not available in published form.

The company's economist belongs to most of the national professional groups, attends the sessions, and does a lot of talking and "data trading" with his counterparts in other companies. Out of these meetings comes a residual "feel" which is invaluable as a balance for the statistical projections.

organizes its sales forecasting program


Miscellaneous Products
Foreign Sales
Industrial Sales
Railroad Sales
Distributor Sales
Government Sales
1
Home office estimates are by industry.
Estimates are based on broad economic picture, projections of industry conditions, correlated to SKF sales by industry.
2
Commercial Research
Combined by SALES MANAGER
Salesman's Estimate
Combined by DISTRICT MANAGERS
Salesman's Estimate
3
District estimates mainly in terms of major accounts, sometimes by product line.
Three forecasts plus final reconciliation checked, modified, and approved by SALES VICE-PRESIDENT
Copies of final estimates sent to Home Office and District Managers. Performance against them by industry, territory, and customer is measured monthly.

"TO ERR IS HUMAN" runs the phrase. It is also costly—in money, time, and effort. Production hold-ups due to errors, strikes, problems, and other reasons can cause a company losses in cash and good-will. By cataloging and filing the sources of delays and their solutions for future reference, efficiency, economy, and better company relations can be attained and maintained.



WHAT WENT WRONG TO-DAY?

MARVIN L. WARNER and JOSEPH H. KANTER

The Warner-Kanter Companies

IT IS NOT enough to know where you are going in business to-day. You must first be sure of where you have been. Business, like history, must look behind to see ahead, which means constant reviewing of methods, techniques, and policies.

The rear-view mirror in business shows what went wrong, why it went wrong, and how it can be righted. The company that keeps its eye on this mirror will profit by its experiences, realize savings of time, effort, and money.

In our business, the construction and management of mass housing units, we want to be the first to know what went wrong. At present, our housing developments are spread into four States covering a wide area—Alabama, Missouri, Ohio, and Indiana—and future developments will see the company operating in still other sections of the country.

In an organization of such a widespread nature, it is no simple job to keep up with operations of the various individual units. However, it can be done, as we discovered when we introduced a system for funneling the operations data to the main offices from all developments. We refer to this system as "What Went Wrong To-day?"

As the name implies, it is a trouble-shooting program, designed to keep top management alert to the various shortcomings in the organization's operations, and bring from the management group suggested remedies and solutions to the various problems.

Here is how it works:

First, top management executives meet at frequent intervals to report on their departments or divisions. These reports consist of the problems of the division or mistakes made by it. There is no orchid-tossing in the meetings, for their prime purpose is to focus the group's thinking on the problems and errors of the organization, and to search out the solutions or corrective measures.

The success of these meetings depends to a large degree upon the spirit in which they are held. Executives must feel free to state problems and errors without being subjected to criticism or blame. Executives must know that they are not being rated by their reports, but that they are seeking and receiving the benefits of group thinking and experience.

The next part of our program consists of weekly reports from our field offices. Once again, the reports are primarily concerned with what went wrong, bringing to the company's attention the problems and mistakes of our field representatives. Each report is carefully gone over and discussed by management. Our files are checked to see if similar problems have come up in other developments and what methods were used to solve them.

Not long ago the resident manager of one of our housing developments submitted a report which was typical of the type this system encourages. He called to management's attention the problem of a small but steady increase in the water bill for his development, and requested suggestions for levelling it off or, if possible, reducing the bill.

At an executive meeting the problem was discussed. The files revealed similar problems in other developments and the corrective measures taken. Further suggestions were added to the case by executives who indicated the problems which were peculiar to this particular development.

The result was a complete course of action for the resident manager mapped out by management, and the problem was solved in the earliest stages. At the same time, there was absolutely no criticism of the resident manager, but rather encouragement to submit future problems just as soon as they arose.

Another step in our program calls for monthly reports from management to the executives and field representatives. These serve two purposes: First, to call attention to situations which are not favorable to the over-all interests of the company; and, second, to let the individual know exactly how he stands, whether the company feels he is or is not doing a good job.

When management found that rent payments in one development lagged behind the average

of the company, the situation was called to the resident manager's attention. In his development rent payment was not completed on the average until the fifth day of the month, while the company average was the third or fourth day of the month. Steps to speed up rent payment were also suggested to the resident manager, and almost immediately the situation improved. Before long it was completely in line with the company average.

The reports which field representatives receive each month from management enable the individual to follow his own progress. For these reports indicate the progress, or lack of same, in a particular project. They also compare the operational figures of one project with those of others and those of the company's average. No manager need be left up in the air as to whether he is doing a good job. He can find the answer in black on white in the monthly reports.

Minutes of all meetings, copies of all reports go into the company's files. In these files we now have a collection of "case histories" of our mistakes and problems and how they were corrected and solved. The information in these files has proved invaluable to the company, enabling us to realize savings of countless hours and dollars, and just in a few short years.

For example: Just recently a critical problem arose in our housing development in Birmingham, Alabama. The resident manager called for our help, asking for priority consideration and quick action. When we consulted our files, we found a similar situation had come up in the Cincinnati development a few months earlier. There was a complete report on the problem and the action taken in the Cincinnati developments, and it enabled us to send out reliable suggestions to the Birmingham representative in a matter of hours.

The vital problem of keeping our finger on the day-to-day developments and progress of the company's construction jobs was solved by the introduction of a system of daily inspection reports. A report comes to the main offices from each construction project every 24 hours. It notes progress, based on a carefully worked out time schedule. And, most important of all, the daily reports tell management what went wrong to-day.

A typical daily inspection report, submitted by field representative in charge of the construction job, might contain such information as:

a. Concrete mixer broke down.

b. Dump truck hit platform, damage repaired.

c. Blank Plumbing Company slowing us down.

d. Weather messed us up to-day, but good.

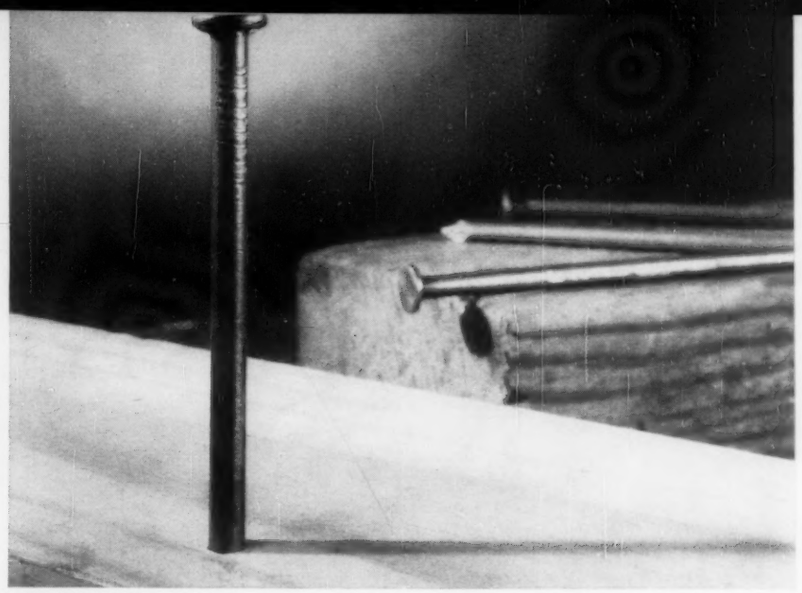
e. Lumber deliveries two days behind schedule.

f. Blank engineering personnel not satisfactory.

Obviously, such information keeps management right on top of each job, enabling us to take necessary action to improve operations.

For example: If a subcontractor, as indicated by a daily report from the construction job, is not working satisfactorily on this job, the company will call for an explanation and for immediate action to improve the subcontractor's performance. If the situation is not improved at once, future bids from this subcontractor on subsequent company projects will not be accepted.

Continued on Page 110



DEVANEY PHOTOGRAPH

Industry knows well that penny-nails, screws, bolts, and washers are reflected in profit and loss statements. Keeping accurate checks and knowing where and why losses, large and small, occur, are basic tenets of long-range economy.

DEVANEY PHOTOGRAPH

Bricks and mortar, wood and clay, men and tools—each element contains a potential problem, and the answer. Widespread operations require a central bureau through which will filter all reports and information for future action.

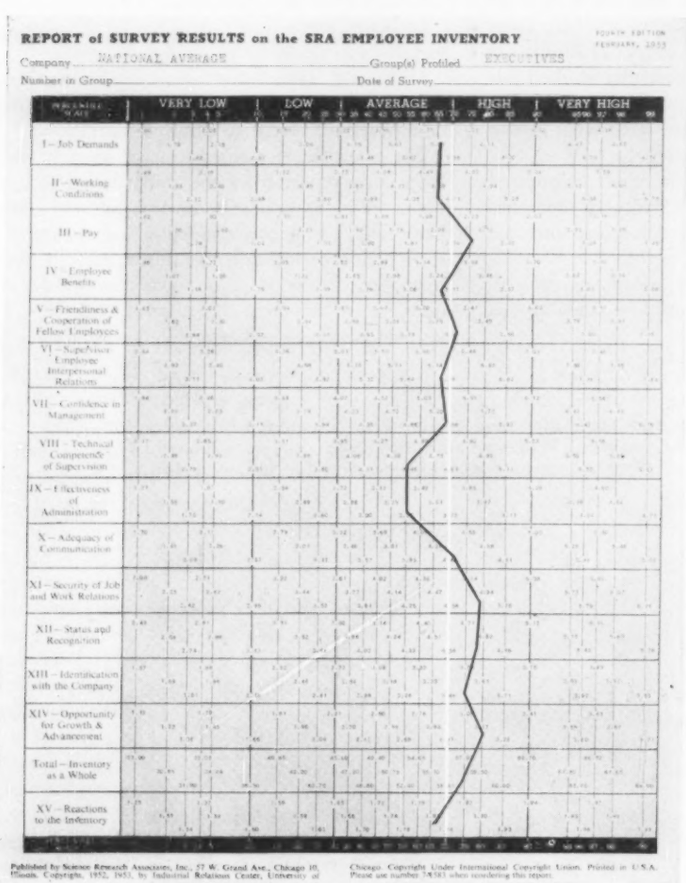
MORALE SURVEY READY-MADE STYLE

Inventorying of employee attitudes, till now a costly proposition or a home-made one, has been brought within everyone's reach by a standardized procedure developed by the University of Chicago. Its wide use makes plant-to-plant comparisons possible.

MORALE is as difficult a matter to measure as virtue. Yet managements regularly make the effort to measure it. They want to know the attitudes of their employees, as a means of uncovering areas of discontent before they breed grievances, and as a help in forming and correcting policy.

Some companies have had their employees' attitudes surveyed as part of a major piece of academic research, some have had a professional consultant do the job. Some big corporations have constructed and administered their own surveys, using experts on their staffs, and even small organizations have put together homespun question-

SRA profile charts show how executives, foremen, line employees st


REPORT of SURVEY RESULTS on the SRA EMPLOYEE INVENTORY
FOURTH EDITION FEBRUARY, 1953
Company NATIONAL AVERAGE
Group(s) Profiled EXECUTIVES
Number in Group
Date of Survey
PERCENTILE SCALE
VERY LOW
LOW
AVERAGE
HIGH
VERY HIGH
I—Job Demands
II—Working Conditions
III—Pay
IV—Employee Benefits
V—Friendliness & Cooperation of Fellow Employees
VI—Supervisor-Employee Interpersonal Relations
VII—Confidence in Management
VIII—Technical Competence of Supervision
IX—Effectiveness of Administration
X—Adequacy of Communication
XI—Security of Job and Work Relations
XII—Status and Recognition
XIII—Identification with the Company
XIV—Opportunity for Growth & Advancement
Total—Inventory as a Whole
XV—Reactions to the Inventory
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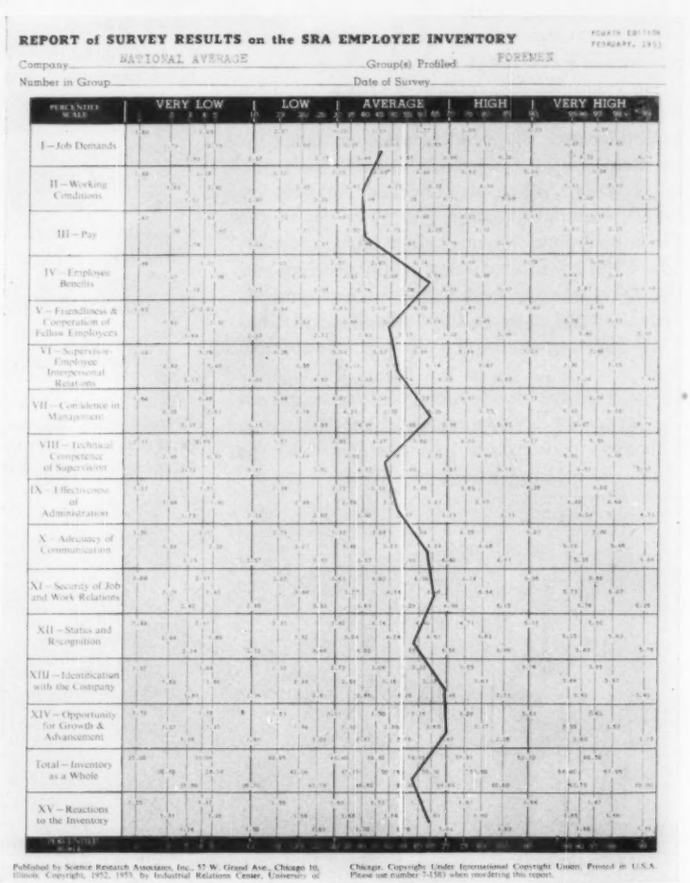
REPORT of SURVEY RESULTS on the SRA EMPLOYEE INVENTORY
FOURTH EDITION FEBRUARY, 1953
Company NATIONAL AVERAGE
Group(s) Profiled FOREMEN
Number in Group
Date of Survey
PERCENTILE SCALE
VERY LOW
LOW
AVERAGE
HIGH
VERY HIGH
I—Job Demands
II—Working Conditions
III—Pay
IV—Employee Benefits
V—Friendliness & Cooperation of Fellow Employees
VI—Supervisor-Employee Interpersonal Relations
VII—Confidence in Management
VIII—Technical Competence of Supervision
IX—Effectiveness of Administration
X—Adequacy of Communication
XI—Security of Job and Work Relations
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The executive profile is high

For ready comparison of morale of different groups, responses to the SRA Inventory are plotted on charts like this. Half the responses of all who have answered the questionnaire fall to the left of the 50 percentile line in center, half to the right. By comparison, half of all executives who answered have been to the right of the 70 percentile line. They are satisfied with security, status, chance for growth, not with administration.

Foreman morale slightly above average

The average foreman the country over rates only slightly above the average for all employees, factory through executive. Note that foremen fall lower than executives particularly in their opinion of working conditions and pay, think much better of employee benefits, and have a good deal better opinion of the company's administrative efficiency. Unlike executives, foremen less often feel they could do their superior's job better.

naires, without benefit of experience or technique.

But, lacking standards against which to compare the findings in their own plants, they have often had occasion, when the survey was over, to ask, "Is this good or bad?"

If 70 per cent of your employees think the pay is all right in your plant, should you be pleased, or worried? The usual course is to ignore the question, or to dispose of it by pointing out that the proper purpose of a survey is to help make a company's morale as good as it can be, regardless of what the situation is in other companies—even if we knew.

The 70% plant-wide figure may be made up of widely varying departmental or work-crew averages. Get after the department that has only a 50% favorable response and improve it, is the advice; investigate the 80% department and see what makes it so good.

Now: Standard Survey

Now the University of Chicago's Industrial Relations Center and Science Research Associates, Inc., have come up with a new form of survey which its sponsors believe may serve as a standard. It has been administered to enough people in a wide enough variety of plants and places so that the plant newly using it may compare its results with the normal response in a broad sample of plants.

Even more, a single plant may compare the responses of its hourly paid factory workers with those in other plants, of its clerical workers, its foremen, or its executives with the attitudes of similar groups in industry at large.

What the profiles of three of these groups look like is shown on the diagrams to the left, below.

The survey, known as the SRA Employee Inventory, is published by Science Research Associates, Inc., of Chicago. Science Research Associates took over the distribution and servicing of the Inventory after the University group had worked it out in co-operation with a number of large industrial and commercial concerns to the point where it was convinced it had a universally useful device for measuring morale.

To date more than 450,000 have answered the inventory questions, and the national profiles are a representative sample of 20,000 or more responses. As additional experience is added, the standards are changed to conform to the additional data. Eventually, when a broad enough sample is available, SRA plans to provide data on the typical response in each of a number of individual industries.

More important to the average employer, however, is probably the fact that in the SRA Employee Inventory he has available a comparatively low-cost attitude survey, designed by experts and tested in commercial and industrial operations, which can be used in a great many ways.

Daystrom, Incorporated, which has had considerable experience with a variety of employee surveys as a part of its human relations program, this year selected the SRA Inventory as best suited to its needs and has now used it in three subsidiary companies. Although SRA will analyze the responses, prepare profile charts of different groups of employees, evaluate the results, and make recommendations for remedial action, Daystrom did all this with its own staff, using SRA forms only as a starting point.

Daystrom, Incorporated, in previous years had used outside organizations which interviewed a sample of employees for anywhere from a half hour to two hours each. It was from a desire to conduct its own surveys that it turned to the SRA Inventory. Again it tested only a sample instead of the full workforce, but since 30 per cent of its employees, chosen at random, were involved, the results should hold for the entire payroll.

In contrast with Daystrom, the B. F. Goodrich Company of Akron, Ohio, which also used the SRA Employee Inventory for the first time this year, employed the complete service administered by Science Research Associates.

Cost is Low

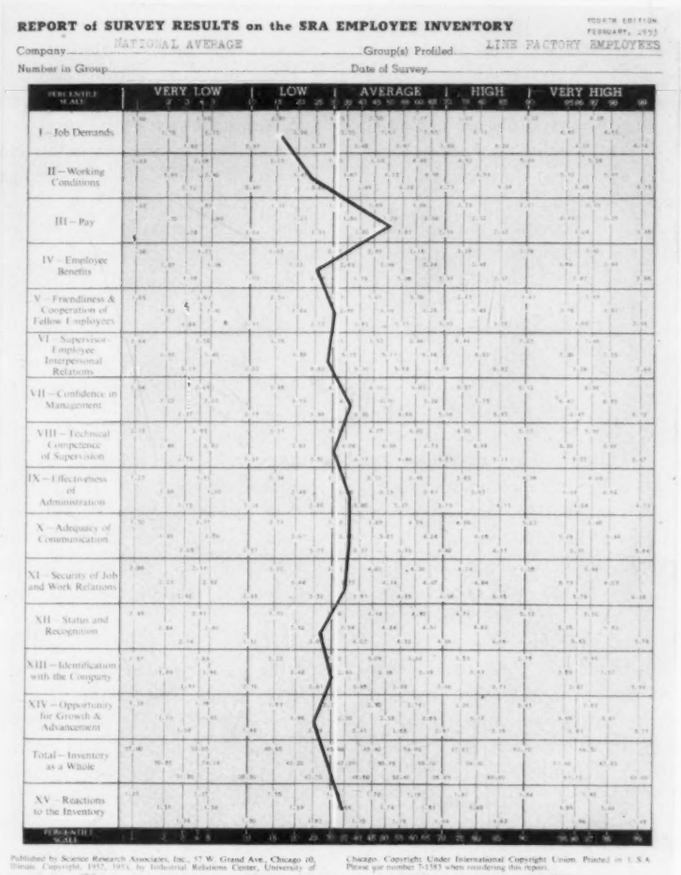
The cost of the survey—from $1 to $3 per employee surveyed—depending on services used—is low enough that it is not likely to be the controlling factor in determining to what extent the user does his own tabulating and evaluating, especially when a sampling may be used in place of an inventory of the entire workforce.

The SRA Inventory consists of 78 questions designed to find out how employees feel about their job and working conditions, the financial rewards for their work, their personal relations with the company, what they think of its operating efficiency, and any personal satisfactions they may get out of the job.

Their answers in these five areas are grouped in 14 categories—what they think of the demands the job makes, of working conditions, pay, employee benefits, friendliness of fellow employees, personal relations with supervision, confidence in management, supervision's technical competence, effectiveness of company administration. Other categories are adequacy of communications, job security and company's fairness, recognition, sense of identification with the company, and chances for growth and advancement.

Administration and scoring of the questionnaire are simple. Questions are on heavy stock, on overlapping pages, in a hard-covered booklet; answers to all 78—and to 13 of its own that the company may add—are made on a single, detachable sheet. The employee checks one of three boxes marked, "Agree," "?," and "Disagree." Filled-in forms are easily scored by any personnel accustomed to accuracy and computational work, as in a pay-

ees stack up in morale


REPORT of SURVEY RESULTS on the SRA EMPLOYEE INVENTORY

FOURTH EDITION FEBRUARY, 1953

Company NATIONAL AVERAGE Group(s) Profiled LINE FACTORY EMPLOYEES

Number in Group Date of Survey

PERCENTILE SCALE | VERY LOW | LOW | AVERAGE | HIGH | VERY HIGH

I – Job Demands

II – Working Conditions

III – Pay

IV – Employee Benefits

V – Friendliness & Cooperation of Fellow Employees

VI – Supervisor-Employee Interpersonal Relations

VII – Confidence in Management

VIII – Technical Competence of Supervision

IX – Effectiveness of Administration

X – Adequacy of Communication

XI – Security of Job and Work Relations

XII – Status and Recognition

XIII – Identification with the Company

XIV – Opportunity for Growth & Advancement

Total – Inventory as a Whole

XV – Reactions to the Inventory

PERCENTILE SCALE

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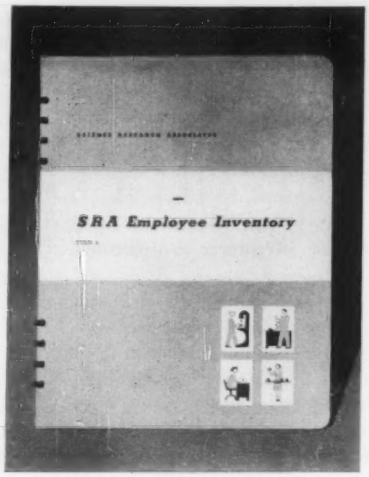
Line factory employees rate lowest

As additional companies use SRA Inventory, Science Research Associates add results in their plants to the national totals from which these nationwide profiles are drawn. Periodically, SRA issues new charts adjusting the 50 percentile line. This is latest for factory workers. Significance of responses by executives, foremen, factory workers in a single plant can be checked against national norms by comparison with these profiles.

continued

Reusable, easily-scored form with 78 queries is heart of SRA Inventory



Answer pads for SRA Inventory may be inserted in questionnaire form (above), then replaced for reuse.

ADMINISTRATION of the inventory is simple. Explanation to employees about to answer questions takes five to fifteen minutes, answering the 78 questions—90, if company takes advantage of opportunity to add some directed at specific problems in its plants—takes another 20 to 30 minutes. Space is provided for writing in comments as well as checking boxes.

Answer sheets are double, sealed at right edge. When they are removed from questionnaires and collected, tabulators tear off the backing. Only certain X's marked by the employee show up on the back of the answer sheet, impressed on it by carbon in appropriate areas on the backing sheet. A simple count of the X's thus imprinted on the back of the answer sheet gives the individual's score.

On other blanks provided by SRA, group and company scores are compiled and then converted into the kind of profiles shown on pages 48 and 49. From the company profile, contrasted with the national average, special problems of the company may be detected. From a chart containing company profile and a departmental profile, special problems of the department may be determined.

Series of successively narrower questionnaire pages let user put all answers on single sheet, coded on back.

roll or accounting department.

To the man looking at a selection of different attitude survey forms seriously for the first time, the questions seem remarkably alike, from one form to another. The question comes naturally, "Why can't I roll my own?" Actually, the framing of questions is a task that requires a lot of thought and experience, if the survey is to yield clear and meaningful results. Good questions are basic to any probing of attitudes, and what they should be and how they should be worded are subjects on which it is easy to get up a good hot argument among the men who construct questionnaires professionally.

Any non-expert who has whipped up a home-made quiz of any complexity, and then has attempted to evaluate the answers, is sure to be glad to turn the next job over to some one who knows how. Questions that are simple to ask often produce answers that are desperately difficult to tabulate without something like a four-dimensional graph to plot them on.

A little contemplation will demonstrate to those without this experience what difficulties of interpretation are likely to arise from the answers. If a man is asked whether he's happy at work, or thinks his pay is fair, his answers may vary as from zero to infinity, depending upon who is asking the questions and under what circumstances. He'll give his wife one answer, his neighbors another, his fellow employees a third, his boss any one of several answers depending upon why he thinks the question was asked, what good he thinks it will do to answer one way or another, what harm may come to him from this answer or that. The meaning of the words will differ from one man to another: What's "fair"? What's "happiness"? Is "fair" very fair, fairly fair, or just barely fair?

The seemingly simple questions of the SRA Employee Inventory, as of other carefully devised surveys, are the result of a good deal of pretesting, of trial and error. Three years in preparation, they were tried out among workers in different industries to eliminate specific references that apply only to a particular group. Language was altered to assure it would be understandable to all employees with a Grade 4 education or better.

Since several questions are asked in each category in the inventory, there is an additional check against being misled by an abnormal response, in any given plant, to a single question; answers to kindred questions give additional data on attitudes within a single category and tend to average out the total response.

Another problem in building a questionnaire is to make certain that the subjects employees are queried about are really significant. The SRA Inventory, because it was thoroughly tried out in plants, warehouses, retail operations before being put in final form, has proven its reliability, its originators are convinced, and they offer statistical data to back up their opinion.

Some academic authorities doubt there is enough experience in attitude-testing as yet to be sure what attitudes are significant in an employee's attitude towards his job and his company. They believe more experimentation is needed, tryouts of more techniques.

Some management consultants likewise think all questions should be devised anew for each company. Only by employee interviews, they say, before a questionnaire is drawn, can problems that bother employees in that plant be spotted. Then the survey may be aimed at getting response on these special problems.

The average plant executive is likely, however, to share the attitude of W. E. Hanawalt, advisor on human relations at Daystrom, Inc.

"The survey is just the beginning of the job," he says. "It's the corrective action, the communications to employees, and the morale-building that such surveys instigate that are most important. For example, we make it a point to tell the employees the results of the survey; we send them a booklet and also hold meetings to discuss in detail some of the points the survey brought out. We follow up in publications and letters by telling what we have done to correct complaints revealed in the survey.

For him, the SRA Inventory made a good starting point.

ALUMINUM

Progress that brings new products

It learns to work with other materials, take on their coloration, fit into standard production lines. Here's how you can put new alloys, fabrication, fastening, and finishing methods to work.

SOMETIMES it seems as though the baby never will grow up. At others, he grows so fast, it's almost frightening. That's been the story with aluminum. And, like any other infant, this one had a full share of childhood problems. On the one hand, it's been spoiled by too-glowing predictions; and, on the other, spanked too hard for failing at applications for which it was not yet ready.

Nevertheless, the baby has survived, and is now approaching manhood. To-day, aluminum production is over 100,000 tons a month—higher than the peak of World War II—and the lightweight metal is running a dead-heat race with copper for the number two spot on the metals team. At the same time, many applications for aluminum which have been conversation pieces for years are at long last hitting the big time in production and sales.

What held them back? Aluminum supply played a rôle in some cases, of course. But even more important were such factors as fabrication and finishing problems.

For instance, aluminum is a "natural" for architectural use. It's strong, light in weight, and non-rusting. But not many people want an all-shiny building. They want a contrast in finishes, and that has been a long time in coming. Porcelain-enameled aluminum was ready for use on building exteriors several years ago—if you had a passion for yellow and brown. But it's only in the past year or two that a full range of weather-resistant colors has been offered.

New extrusion alloys have been developed in recent years, too, that can be given weather-resistant dull gray, copper, and gold finishes in addition to the standard aluminum color.

The advantages of aluminum tanks, truck bodies, chemical reactors, and heat exchangers were outlined years ago (light weight, resistance to acids and solvents, and so on), and a few were built. But, until fabrication and welding techniques had advanced to their present stage, and special alloys had been developed, such equipment could not reach general use.

The electrical industry began to nibble at aluminum during World War II's copper shortages. But it couldn't begin to take healthy bites until it could fit aluminum into its high-speed production lines. Thus, General Electric spent a good many years testing sheet alloys and solders and trying out aluminum lamp bases (photograph on page 51) before it was ready—early this year—to go full speed ahead with them. Engineers at the GE lighting division at Nela Park now feel that aluminum is actually superior to brass for this application.

Thus, in every case, aluminum not only had to demonstrate its potential advantages, but also to qualify in the three "F's"—fabrication, fastening, and finishing—before it could graduate into large-scale use.

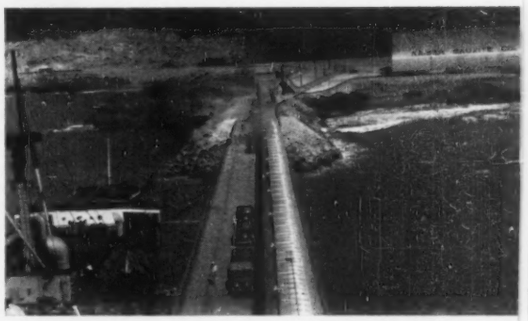
The photographs on pages 48 to 50 show how much progress it has made in these areas in the past few years.

At least as great has been the progress in aluminum foil and powder. For instance, foil-lined fiber drums as a substitute for metal went into large-scale production about a year ago. Preformed, packaged food containers were introduced by Reish Products, Inc., and Phoenix Industries, Inc., early this year. Plastic laminates are appearing with a layer of foil to increase heat resistance.

As to aluminum powders, they're not only finding a big market in paints, but also in new metal-patching compounds, coatings for textiles, and sintered parts (see below).

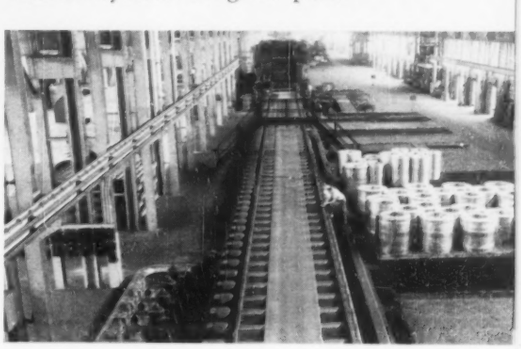
But it's not all clear sailing even now. Take the question of cost, for instance. Twenty years ago, in the depths of the great depression, copper was selling for less than 8 cents a pound (at times, as low as 5 cents). Aluminum averaged over 22 cents. To-day, copper is hovering around 30 cents a pound, while aluminum is 21 cents. That seems like a big plus for aluminum. In practise, though, the cost of semi-finished forms and finished aluminum parts may equal or exceed that of copper and its alloys. So, a sharp drop in the price of copper might well threaten some of aluminum's new uses—especially in the electrical industry.

Though aluminum gained a toehold in many industries because of copper shortages, it is not

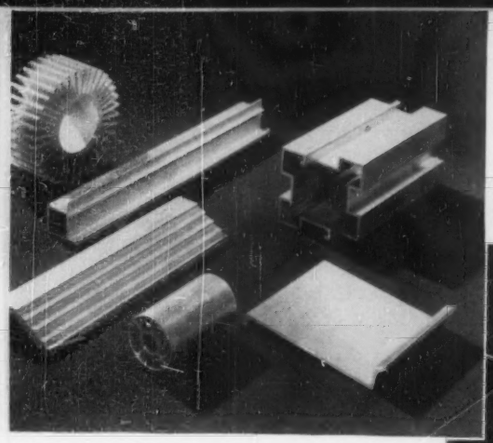


New ore sources are being opened in Jamaica and South America to meet projected demand. This is part of Port Kaiser development.

New pot lines are helping to boost primary aluminum over the million-ton-a-year mark. This is Reynolds' Longview plant.

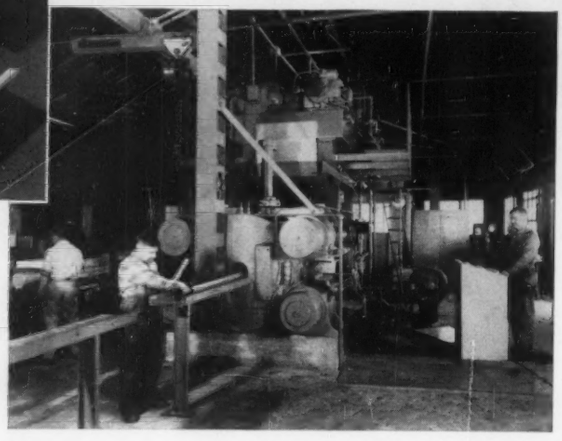


New rolling mills increase supply and quality of semifinished forms like this hot-rolled strip at Alcoa's Davenport Works.



Complex shapes may now be had in easy-to-use extruded form. Many are carried in stock.

New forms ready to meet product needs



Growing with aluminum are independent producers of semifinished materials. Precision Extrusions now has presses up to 2,100 tons, handles variety of alloys.

An important measure of a material's usefulness is the shape it's in. And the more shapes, the better. Thus, a real index of aluminum's growth is the variety of semifinished forms which are now obtainable from stock, and the variety of fabrication methods ready to turn them into finished parts.

Catalogs of extrusions, roll-formed shapes, and the like, are growing bulky indeed.

Precision Extrusions, Inc., for instance, now lists 4,000 items in its catalog of standard shapes. A few years ago, it could offer barely 400.

And, as Revere Copper & Brass points out in its latest booklet, extrusion dies for aluminum are low enough in cost so that even custom-made shapes are surprisingly inexpensive.

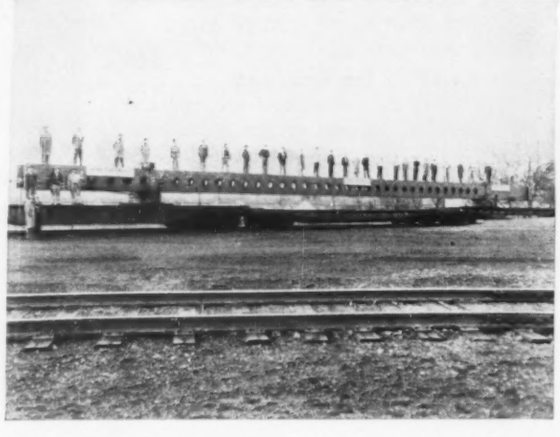
New, heavier presses are producing bigger and better forgings and extrusions and sheet-metal forming techniques are being vastly improved (see *Modern Industry,* June 1951, page 40, and November 1951, page 39).

There are new developments, too, in die, permanent mold, and sand casting, powder metallurgy, and precision casting.

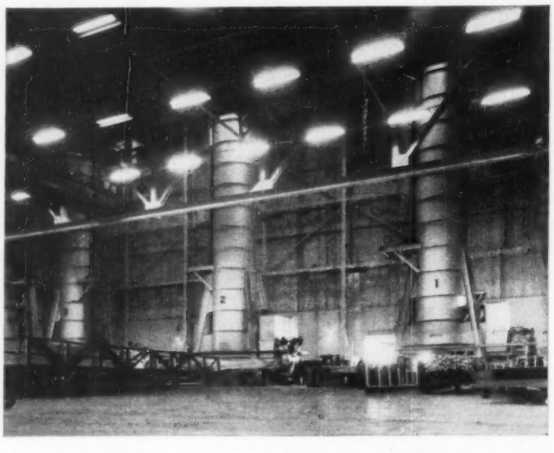
So much has been learned, in fact, about making alloys easy to shape that Reynolds Metals is now introducing aluminum for home workshops and planning to sell it through hardware and building supply stores.

The photographs here show a few of the forms of aluminum which may be had for industrial use and some of the facilities for producing them.

Specifications (for extruded shapes, castings, and other forms) are published by the Aluminum Association, 420 Lexington Ave., New York 17, N. Y., and may also be had from major producers and fabricators. Booklets issued by the latter, incidentally, have been extensively revised in recent years. If you're still following texts issued during World War II, you may be missing out on a good many cost-saving ideas. New, easier to fabricate alloys, new forming techniques, and the like, unveiled in the past few years, are turning many of aluminum's "minuses" into "plusses."



Bigger and bigger equipment is being built to handle new, larger, aluminum extrusions. This is part of stretch press for Alcoa's Lafayette Works.



Auxiliary equipment is growing up, too. These vertical heat-treat furnaces handle big aircraft extrusions at Harvey Machine Company plant in California.

without supply problems of its own. Our high-grade ores are rapidly being used up. New sources of cheap hydroelectric power are badly needed if aluminum production is to be expanded.

The first problem is being met by development of Caribbean and South American ore deposits (see photograph, page 51) and by processes that may permit use of lower-grade U.S. clays.

The second problem is a tougher nut to crack. Aluminum refining takes tremendous amounts of electricity, and its availability at low cost from Government hydroelectric plants has done much to keep aluminum's price in line. Now, we are running out of power dams—and rivers to put them on. Other power sources have been, and are being, investigated. Alcoa, for instance, is negotiating for Canadian power, and is also running extensive tests on use of low-grade bituminous coal (lignite) for power generation. Kaiser and Reynolds each have a plant running on natural gas. But new power sources are still a top priority problem. If, as the President's Materials Policy Commission predicted, aluminum use is to triple by 1975, something will have to be done about power—and soon.

Too, new developments in plastics and such metals as titanium may give aluminum a run for its markets.

In the transportation field, aluminum will have to cope with its lightweight sister, magnesium. It has been threatened by titanium and stainless steel, as well—particularly in supersonic aircraft. Commercial aluminum alloys lose much of their strength at 600° fahrenheit. Yet, high-speed jet planes may develop wing temperatures of 700° or 800° fahrenheit or more. Titanium and stainless steel have seemed like the best answer. Now, though, a brand new approach to fabrication of aluminum parts promises to help meet this challenge.

The new approach involves a special type of powder metallurgy which combines cold pressing, hot pressing, and extrusion. Speaking at the recent Conference, held in connection with the first Exposition of Basic Materials for Industry, J. J. Harwood of the Office of Naval Research said such sintered aluminum parts have a strength and creep resistance at 600° fahrenheit that is two to five times as great as that of conventional alloys. And, he noted, "exposure of these sintered parts to temperatures as high as 900° fahrenheit for as long as 100 hours results in little or no change in room temperature tensile properties."

Aluminum to-day is still a young material. It has a lot to learn, and industry has a lot to learn about it. But, as the pictures on the following pages show, it's ready to meet new needs and build new sales appeal into products from hand tools and home appliances to textile machinery and materials-handling equipment.

Learning how to join aluminum parts

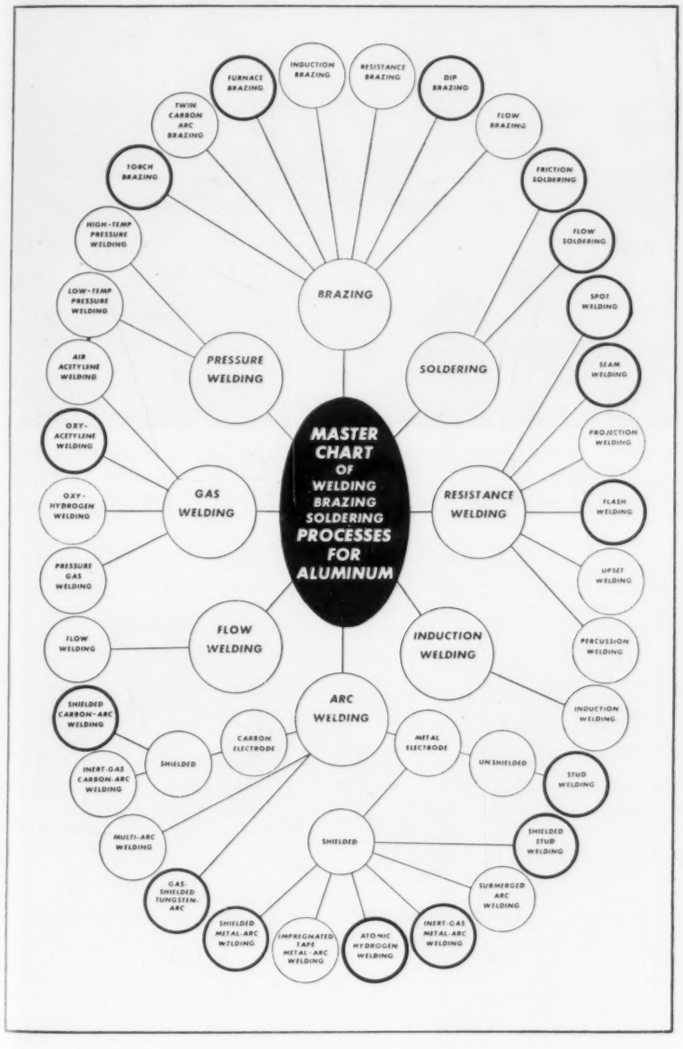
To be broadly useful, a metal has to be a good joiner. It has to work with other parts and other materials.

There are plenty of fastening devices for aluminum—clips, rivets, studs, bolts, locknuts. But continuous seams presented plenty of problems for a long, long time. Many of the strongest and most useful alloys were extremely difficult to weld, braze, or even solder.

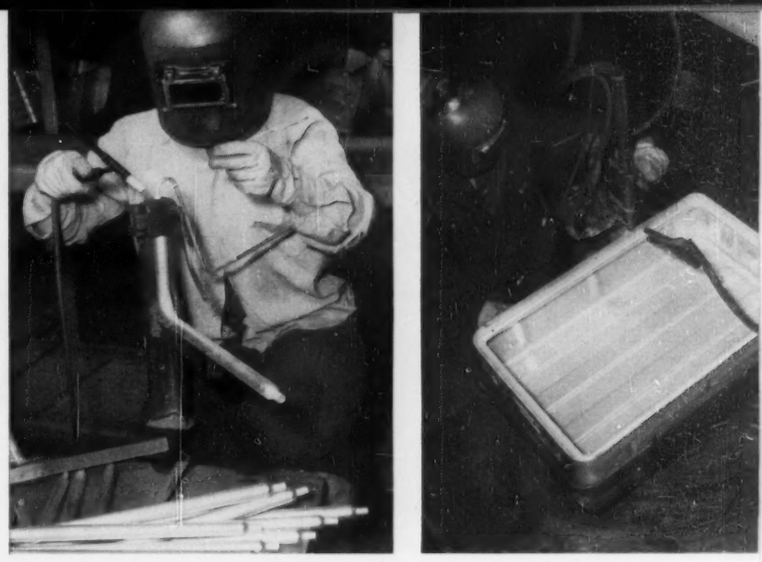
Now, as the chart below and the photographs on this and the following pages show, these problems are rapidly being solved, and new joining techniques are opening up a variety of electrical, architectural, and equipment applications.

In addition to such welding techniques as inert-gas-shielded arc, there are new pressure-bonding methods like "cold-welding" (see *Modern Industry*, December 1952, page 152) which make it possible to join thin aluminum sheets to thick ones, and to weld aluminum to copper. Other up-and-coming processes are flow, stud, and induction welding; and induction and resistance brazing.

There's progress in another kind of "joining," too. Aluminum-clad steel; copper, tin, zinc, and silver-clad aluminum; and aluminum-plastic laminates are opening new doors for makers of electronic equipment, machine parts, and home furnishings.

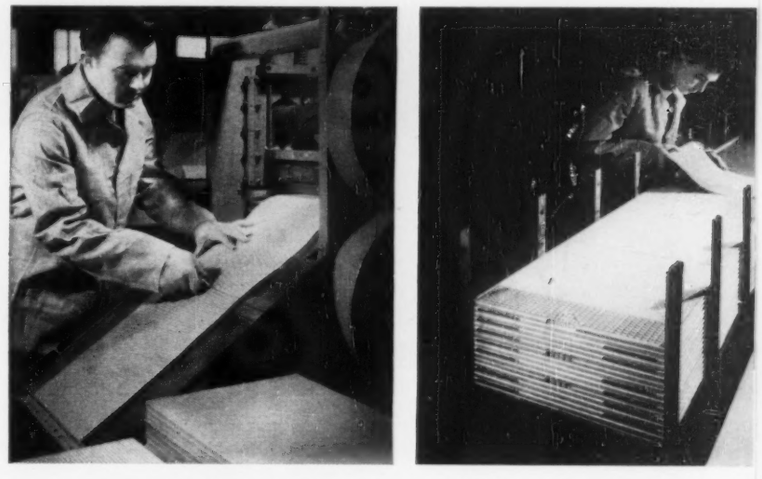


More than 30 welding, brazing, and soldering techniques are now ready for use in joining aluminum. In this chart, prepared by Reynolds Metals, most-commonly used methods are heavy-circled.

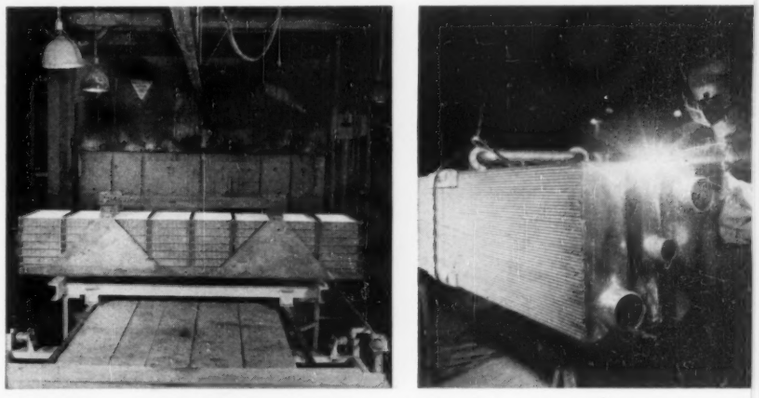


New welding methods, and new alloys to go with them, are rapidly solving fabrication problems. Here, Reynolds Metals demonstrates manual and automatic inert-gas-shielded-arc welding.

New joining techniques bring new aluminum products



New brazing methods make it possible for the Trane Company to produce new, lightweight aluminum heat exchangers. At left, sheet metal is corrugated; at right, core is laid up for brazing.



Assembly is heated, then brazed automatically (left), and headers are welded on (right). This unit, for a tonnage oxygen plant, has nearly 8,000 square feet of heat transfer surface.

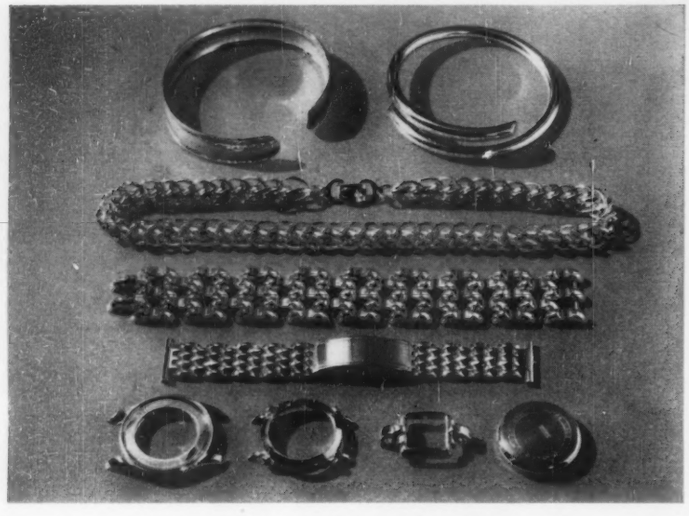
New finishes broaden engineering, decorative uses

Even without "makeup," aluminum has a pretty face. But everyone likes a change of expression. That's why a basic material needs a variety of finishes—a selection of surface textures and colors to meet both engineering and decorative requirements.

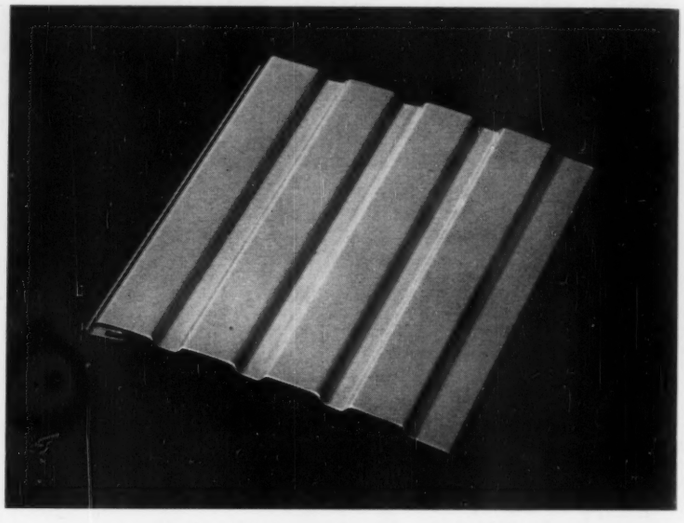
For instance, aluminum's light weight and flexibility can be put to work in many more machine parts now that new, hard, wear-resistant coatings—produced by low-temperature anodizing, vapor deposition, and "Flame-Plating"—are available. New electroplated and "electroless" nickel, chromium, and cadmium coatings, and new paints and organic enamels are ready to improve product appearance as well as performance.

In finishing, as well as in fabrication and fastening, it has not been simply a matter of developing a new process, but also of new alloys and new design techniques. As just one example, production of the lustrous gold finish pictured here requires a special, high-purity material because it's a conversion-type coating, the smoothness of which depends on the homogeneity of the metal surface.

Range of finishes and variety of products on which they're used is pointed up by this Alcoa picture. Piston has new hard coating; refrigerator part is enameled; spray gun has shiny chrome finish.



More lustrous than gold is the oxide coating which can be produced on high-purity aluminum rod and sheet. Because it resists wear, won't tarnish, it's opening up broad new decorative uses.



Porcelain enamels for aluminum may now be had in many weather-resistant colors. This architectural panel is made from Alcoa material by Kawneer Company; used for store fronts, service stations.

Chrome plate gives housewares a smooth, hard surface; paves way for aluminum teapots and percolators. Makers of hardware, hand tools, home appliances might also add new spice to their products this way.

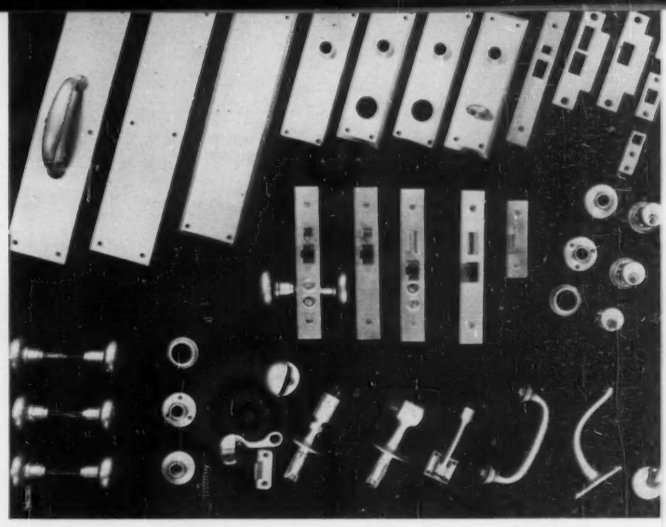
New hard coatings offer high abrasion resistance for gears, impellers, piston rings, bearing races, hardware. Finishes are of oxide type, produced at low temperature. Alcoa has developed half-a-dozen types.

Many buildings now use aluminum. Prefabricated sections like Robertson Q-Panels on tower are especially popular.

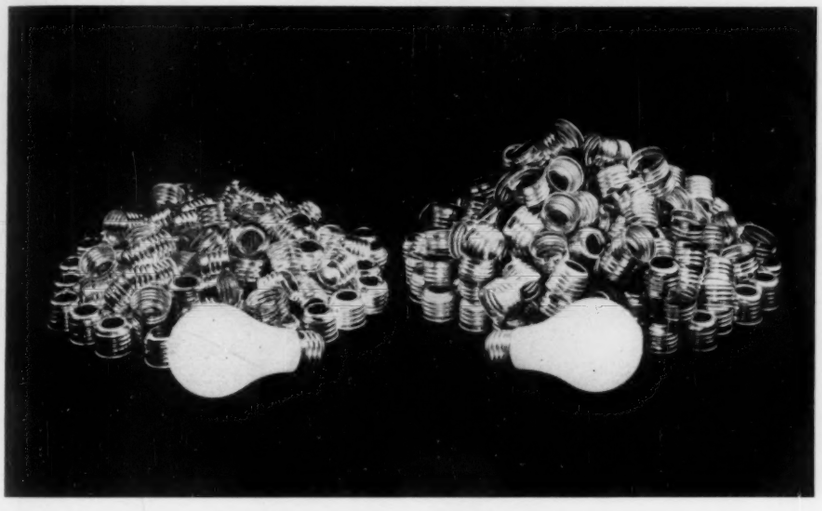
And here's how it's used

Pictured on this and the following two pages is a cross-section of new aluminum products — architectural, electrical, transportation, hand tools, machinery, and miscellaneous equipment. Each one takes advantage of new developments in alloying, fabrication, fastening, and finishing, and each illustrates how aluminum can add new values to established products, or open up new product opportunities.

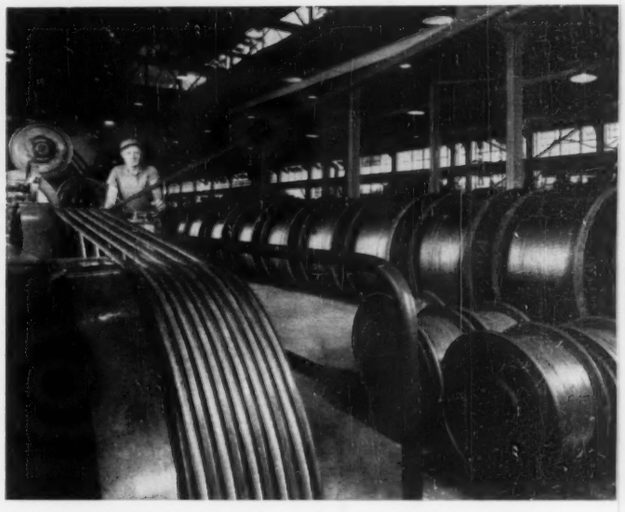
What can aluminum do for your product? You'll never know until you try—and now's the time to find out.



Aluminum hardware is durable, attractive, easy to maintain. Yale Lock and Hardware Division of Yale & Towne now offers a full line of contract items to meet growing demand.



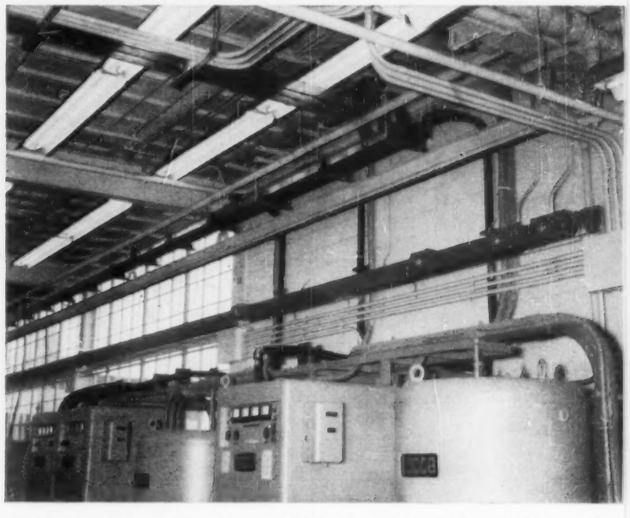
Electrical applications for aluminum are growing fast. It took time to solve fabrication problems, but General Electric says aluminum lamp bases now out-perform brass. Metal's light weight permits more bases per pound (right), helps hold costs in line.



Heavy duty cable is also changing to aluminum. Anaconda Wire & Cable, which once made only copper, now turns out many products of the lightweight metal as well.

New gas meter, by Rockwell Mfg.Co.,uses cast aluminum body to reduce weight, increase weather and shock resistance.

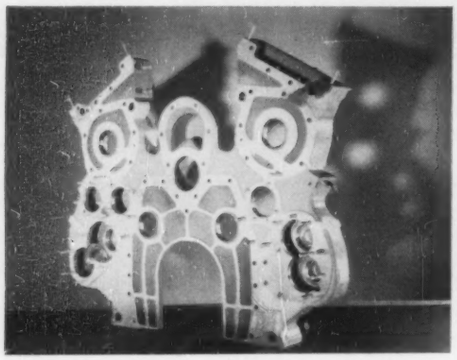
Aluminum reactor windings need not be enameled. Metal's natural oxide coating provides insulation, says Westinghouse.

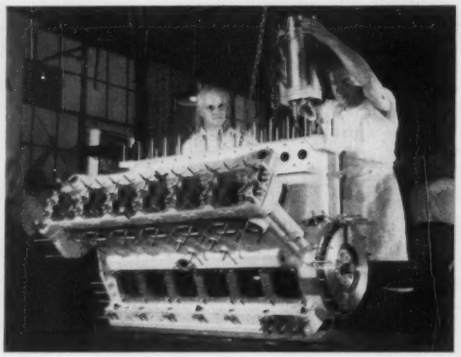


Bus-bars of aluminum in new Ohio Crankshaft Tocco Division induction-heating research laboratory saved money, were easy to install, perform well.

Marine applications for aluminum are increasingly successful as more is learned about alloying and fabrication. *S. S. United States* aluminum superstructure, here, is largest so far.

On land, on the sea, in

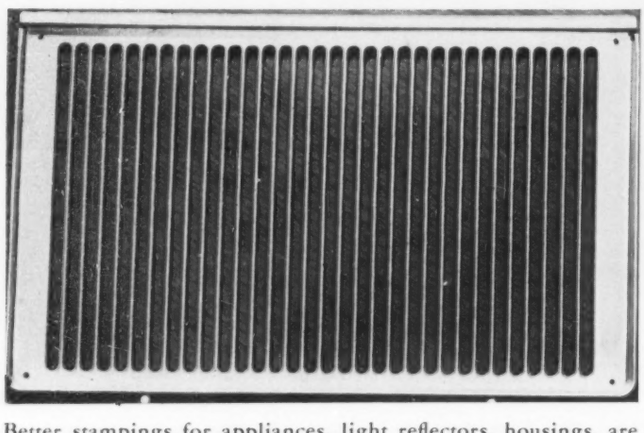




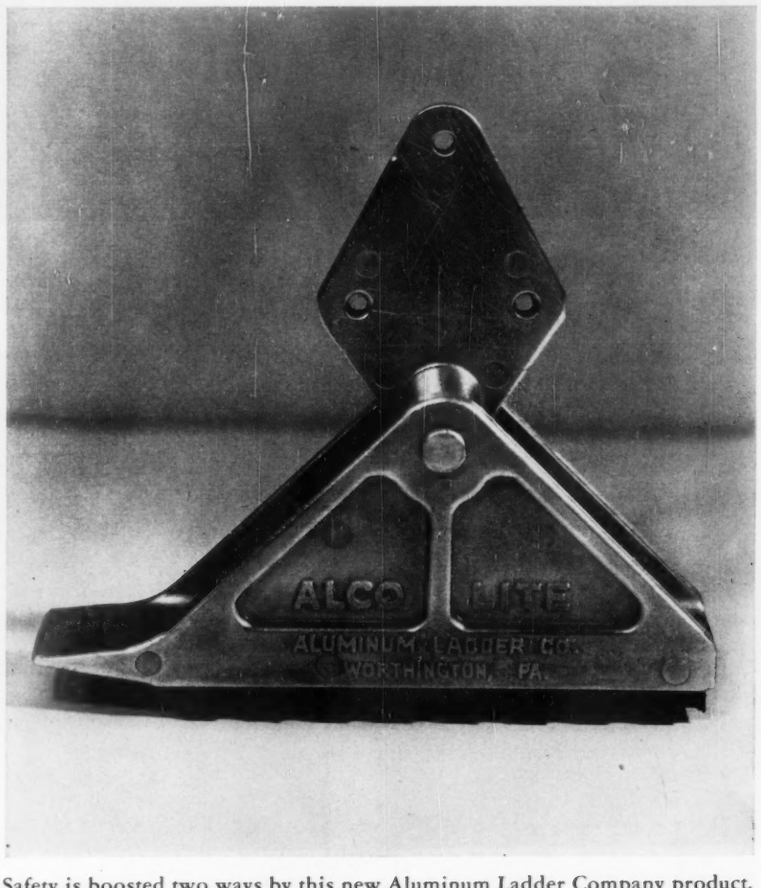
Marine Diesel, being built by Packard for the Navy, makes extensive use of aluminum to reduce over-all weight. Housing at left, for instance, would weigh 140 pounds in steel, tips scale at less than 70 in aluminum. Military is also encouraging use of the metal in ground vehicles.

Extruded window frames and door moldings of aluminum are pioneered by Nash. They're good-looking, easy to handle.

Truck and trailer units carry more because they're lighter in weight, remove danger of rust contamination. Kaiser Aluminum & Chemical Corporation did basic design on these.



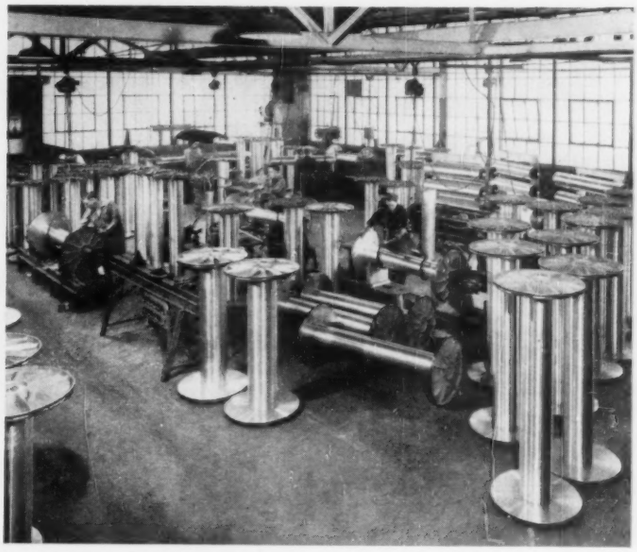
Better stampings for appliances, light reflectors, housings, are possible with new magnesium-aluminum alloys. This refrigerator shelf is made of Kaiser's "K155" alloy.



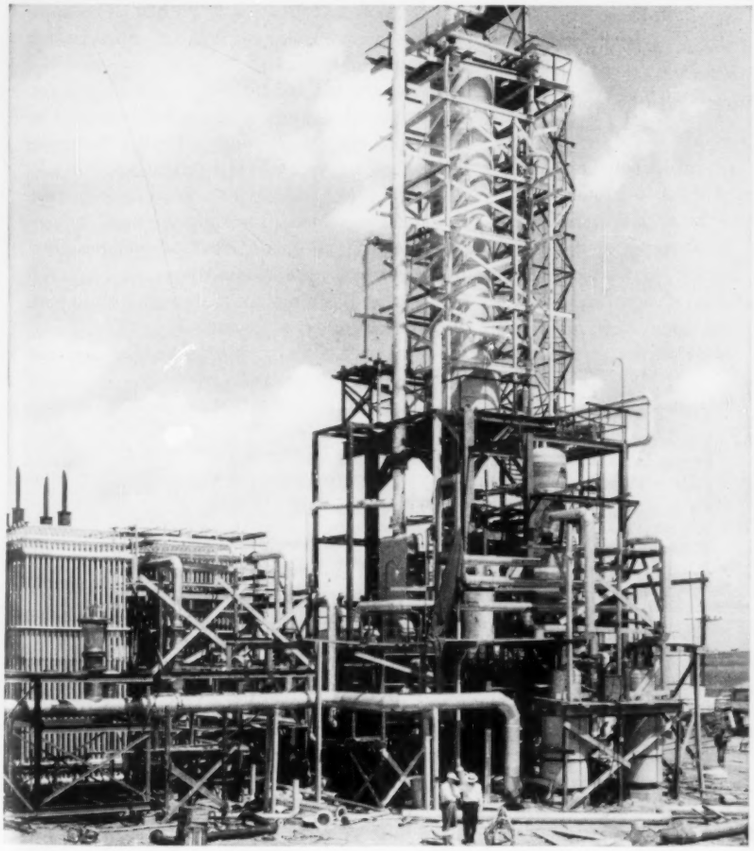
Safety is boosted two ways by this new Aluminum Ladder Company product. It's a cast-aluminum ladder shoe, usable with rubber tread or spike down. It attaches to standard ladders, stops slipping, won't spark.

...in the air, and in the plant, aluminum moves ahead

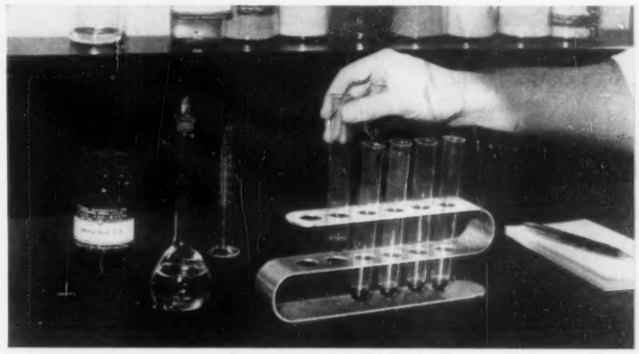
Pipelines for both gas and water are now being tested. Light weight makes them easy to handle; corrosion resistance eliminates need for protective coatings, reduces maintenance, Reynolds Metals Company points out.



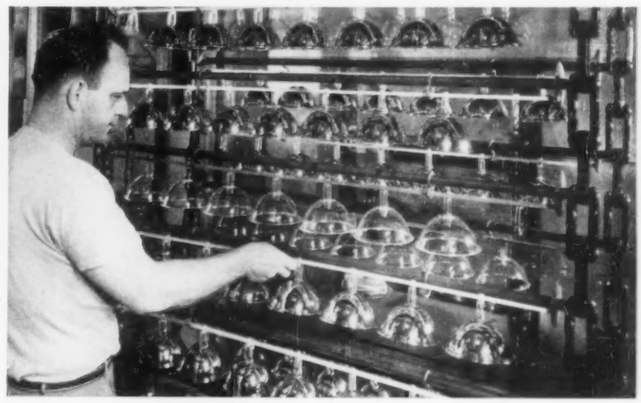
Textile industry is taking to aluminum, too. Hayes Industries, Inc. makes these big section beams for heavy tire cord; also produces beams for nylon, rayon; spools and bobbins.



New oxygen plant has aluminum vessels, pipe, heat exchangers, even uses the metal for building roofs and siding. Alcoa supplied the material. Argon and tungsten arc welding, dip brazing were extensively used.



Laboratory applications for aluminum include new and novel test-tube rack by Fisher Scientific Company. They're durable, nest neatly for storage.



Better light for photography comes from these Eastman Kodak "Lumaclad" aluminum-coated plastic reflectors. Company uses own Tenite plastic, DPI vacuum metallizing equipment.

LIGHT, COLOR and *Design*

HOWARD KETCHAM
Howard Ketcham, Inc.

The importance of these inseparable salesmen looms ever larger for expanding industries and markets

AS WE NOW move into a rapidly expanding buyers' market of almost unpredictable limits, the importance of a well-planned sales appeal is obvious. Its force is certain to push some products as fast as they can be made, while competitive products gather dust in storerooms and warehouses. The buyers will make the choice in such a market. And it costs less to find out what people want and to sell it to them, than it does to try to sell them what they don't want.

The average manufacturer's efforts to create products with sales appeal are at least ten years behind his fabricating efficiency. For more saleable products, for better and more imaginative merchandising, he and his dealers need to know about preferences for designs, about the right colors, and about effective lighting that influence buyers' choices.

The experienced color and design engineer plans his work to answer a series of questions:

1. What is the function of the color plan?
2. What are the conditions of use?
3. What color and designs do competitors employ?
4. Where will colors be applied on the product?
5. What psychological relationships are involved?
6. What background colors and display require consideration?
7. Under what lighting will the colors be viewed?

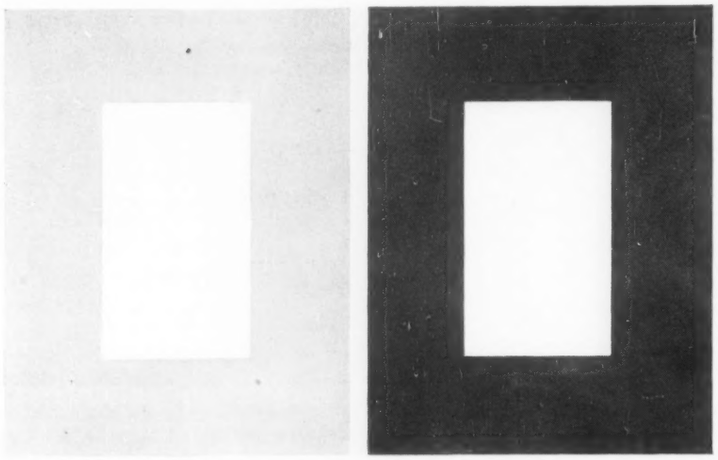
To-day, with emphasis on production, the much-applauded efficiency of our manufacturers guarantees that there will be an ample flow of new products to satisfy the demand of the rapidly expanding buyers' market—but which new products will appeal to buyers who are measurably more selective than they were, even a few years ago? They have the money to buy. US Government statistics on the enormous accumulation of savings, as well as the substantial margin of middle-group income over the boosted living costs and taxes, indicate that there is ample buying power. Those American dollars must be drawn out by the appeal of products attuned to the bright and cheerful pattern of modern living.

Gone, and unlamented, are those monotonous "preferences" of 30 years ago, when timid buyers and cautious manufacturers avoided interesting and appropriate colors. The successful product to-day is designed in appropriate and effective colors, and properly lighted so that the informed buyer can see it at its best. The combination creates sales appeal and that means merchandising success.

Restate the objective as "eye appeal" and the importance of design and color is obvious. The American eye has become adjusted to color. Make the test yourself by comparing a black-and-white photograph with a good color picture of the same subject. The meaning and beauty are enhanced at once. When a well-designed object is given appropriate color and displayed with proper illumination, there is the same gain in appreciation.

Continued on page 166

The darker the background, the brighter a light color will look against it.



RED ON WHITE

The combination of red on white is difficult to read because of the vibration factor. Red is a stimulating color; the famous coach, Knute Rockne, painted the wall of the team's dressing room red to inspire the home team between halves, while dulling the edge of the visitors by placing them in a dressing room painted in relaxing hues. Sports programs and certain types of magazines have better sales with red covers than with any other color. But it is an irritating color for reading, because of the vibration. A railroad which printed a timetable in red caused difficulty for passengers; when they tried to read the fine type, it seemed to "jump."

YOUR EMOTIONS
Using them at work

Do you always try not to show your feelings at work?
Then you're wrong. Read why, and how, emotion is an executive tool.

YOU HAVE no doubt seen an executive, literally white with held-in anger, face his subordinates who, knowing he was justified, start to right matters without further to-do. Or you have noted the immediate response an aggravated boss has won from an employee when he remarks wryly, "I should be furious with you, but you're so like I once was, I hope you will see the day—as I do now—when a situation like this is even a bit funny."

Getting things done through people depends a lot on how a man expresses his emotions in a face-to-face, interpersonal situation; whether it be stormy or calm.

An old saying goes, "If you want to win an argument, get your opponent angry, he'll make a fool of himself." But a more scientific rendition of this moral is: "If you want to win, be very sure you keep him *blindly* angry, else he'll make a fool of *you*."

Why is this so? Because human action and thought are motivated by emotional energy. Without this energy nothing much will be accomplished, especially when the way is rough. The man who is aroused to an angry pitch, but is not blind with fury, can let off steam for a purpose, and propel himself, and others, toward a goal.

Cool, Calm—and Rejected

On the other hand, you can probably remember a time of crisis when the executive handling it showed no emotion—mad, scared, or glad. Nor did he assert his leadership and make the necessary change in plans. Bluntly, he ducked out.

Such action is characteristic of many men who clamp down on emotional arousal. Blind imperturbability or blandness is as dangerous as blind anger. It is not real self-control. Actually it means one has not learned how to turn emotional arousal from fussing and fuming into forceful action. Deliberately invited non-arousal breeds indifference, inaction, and indecision; and is the executive's Lorelei.

Find a man who controls not his emotional arousal, but its manner of expression, and you have a leader of men. He knows that displays of anger or fear; of sardonic humor or amused tolerance; of warm sympathy or impersonal hardness effectively move others into action. And he also knows that these displays work best when used by a clear head. This calls for a delayed outward display of his inner tumult—but not too long delayed, or his motivation is lost.

The point is, he recognizes his display as a technique to help him get something accomplished; he does not go into his "act" blindly, or instinctively. He has his emotion sufficiently under control to know what to do with the steam it generates, and why he should do it.

As President Michael H. Levy, Michael Levy Company, Inc., put it: "Controlled, manipulated display of emotions should be a tool of any executive. Under these circumstances, a good 'mad act' can be very effective in order to get a point across."

On page 61 are cartooned various calculated emotional "acts" to get things done through people. Does the word "act" sound callous and insincere? Then look at it this way:

If one is sincere in wishing to improve an interpersonal situation; if his purpose is to solve a human relations problem for the general good,

What is your EMQ?

You may know your IQ; but how sure are you of your EMQ (emotional management quotient)? If it is high, you should have no trouble answering these ten questions.

When something personally important is at stake, can you resist your instinctive, habitual reaction in an interpersonal situation (like ranting, or clamming up)?
Yes ☐ No ☐

When excited, can you withhold action long enough to regain self control, and act intelligently? Yes ☐ No ☐

In choosing a line of emotional conduct likely to force people into favorable action, do you take into account your psychological makeup (whether to play it in high or low key)? Yes ☐ No ☐

When emotionally aroused, are you versatile enough to pound the table, exercise calm detachment, or sweet reasonableness as the occasion demands?
Yes ☐ No ☐

Are you able to decide on an emotional role to play, follow it through, and take the consequences without worrying?
Yes ☐ No ☐

Do you drain your emotional energies in little spats, unavoidable irritations, normal worries? Yes ☐ No ☐

Are your daydreams a substitute for, instead of an incentive to, the solution of your human-management problems?
Yes ☐ No ☐

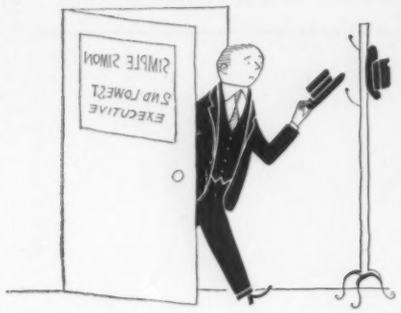
Do you become involved in the personal situations of business associates which you cannot improve? Yes ☐ No ☐

In emotionally charged situations, do you withdraw to inactive worry instead of resolving the difficulty—or trying to?
Yes ☐ No ☐

Do you carry your problems home at night (in your head, or in a brief case) without actually getting anything done on them?
Yes ☐ No ☐

First five are yes; second five no. See cartoons, next page, for reasons.

Waste, and you shall want



Here comes a man into his office who is going to waste his emotional energy the whole day long by spending it on turmoil that yields no dividends. By five o'clock, he may be limp as a rag; certainly he will have reduced his accomplishments with employees to bankruptcy. Notice the ways in which he upsets himself needlessly. As Marvin Warner, a partner of Warner-Kanter Companies says, "Why get aroused if it doesn't help you get the job done?"

Routine annoyances: He abused his supply of emotional energy by permitting the little office spat, gossip, jealousies between executives to upset him.

Daydreams: He dribbles away his emotional energy in visions that frustrate him instead of spurring him on, as dreams, if not too impossible, can do.

Borrowed experiences: He becomes emotionally involved with the personal troubles of employees and associates, even though he can't hope to solve them.

Futile rebellion: Some things, big or little, have to be accepted. But this man doesn't see it that way. He finds a hot potato in any situation.

Rigidity of behavior: He shows his feelings the same way each time. His subordinates know what to expect; and, instead of his handling them, they manage him.

YOUR EMOTIONS

continued

then it matters not if he feels angry when he acts polite, or acts angry when he is merely bored. His over-all sincerity of purpose will put truth, not falsehood, into his behavior and carry conviction.

The executive who uses—not abuses—his emotions at work also does this: First, he determines how to display his feelings according to the type of personalities involved in the situation; next, he follows through without a change in his act (otherwise he develops uncertainty in others); and finally, he accepts the consequences of his action without stewing over it. Regardless of the outcome, he makes peace with himself, by admitting, "Well, it wasn't so smart after all, I'll have to think of something else." Or, "That was good, I'll do it again."

DUN'S REVIEW AND MODERN INDUSTRY's chief consultant on psychological problems of management men is Dr. G. L. Freeman (former professor at Northwestern and Cornell, a key figure in the Navy's selection program during World War II, and author of many books, including *Mastering Your Nerves,* Harper & Brothers, 1946; and *How to Pick Leaders,* Funk & Wagnalls, 1950).

Freeman emphasizes, in particular, three factors about emotional energy. One, many businesmen become needlessly aroused, so that this energy is wasted like gasoline leaking from a tank. Typical waste is cartooned on this page.

Two, there is no exact how-to formula to follow in correctly expressing emotion. Each person is a law unto himself. Best thing is to learn to recognize your own natural emotional response pattern (its pitfalls as well as its advantages), and then better it.

A mature man cannot make himself over fundamentally. But he can improve himself within the limits of his own emotional framework.

Tempered Temper

Figure out which of the responses cartooned you use most frequently. Ask yourself: Does it wear me out? Is it suitable most times? Am I flexible enough so that I don't express myself in exactly the same way every time? What can I do to improve?

Freeman's third point is that all outward emotional displays can be classified generally as low pressure, or high pressure action. In other words, some people play their emotions softly, others forcefully.

Take Secretary of Defense, and ex-president of General Motors, Charles E. Wilson, for an example. About him, an associate said: "He's a

low-pressure executive. I've never heard him raise his voice in anger. As a matter of fact, I've never heard him give an order to anyone.

"You just do what his facts show should be done. If you don't see them, he won't be disturbed, he sells and sells you until you do see."

The other type of emotional arousal is definitely higher and tends to convey to others a great deal of forceful energy and excitement.

In this classification belongs such a man as the personnel director of a Midwest manufacturing company who, even over the phone, can control others with his emotional impact. Here are the steps in his telephone technique: (1) Friendly opening; (2) Shock—impact questioning; (3) Sardonic humor or quick sympathy as the situation requires; (4) The business-must-drive-on act; (5) Physical movement to match his voice inflections; (6) Unpredictability, to keep the other fellow on his toes.

Applying the Pressure

Of course, to be able to use either low or high pressure emotional expression (as the occasion demands) is the ideal situation, as Myron Piker, president of Hamilton Metal Products, points out, since some people respond to one, some to the other.

When you have figured out your own emotional classification, however, keep these facts in mind. Some people lack energy to use freely in outward expression. So they should play a low key in a way that makes every unit of energy count. On the other hand, the forceful man, with energy to burn, has a tougher time learning to make use of the delayed response when displaying his emotion.

Talking about a seemingly irrelevant subject is the method of one vice-president who cited the following story: A subordinate, frustrated by his immediate superior's inability to delegate, deliberately and tactlessly tried to force the vice-president into upbraiding the "culprit."

Whereupon, the vice-president, boiling mad, picked up a book and started talking about a situation it brought to his mind. As he got control of himself, he carried the conversation around to the complainer himself, clearly let him know that he had acted like an upstart; and then got to the point of the actual problem.

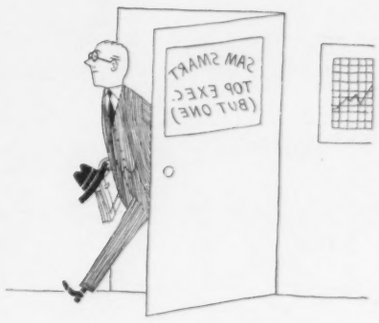
He had used emotion to good advantage, for the complainer admits he grew up a lot that day.

"A man, deeply wrapped up in his work, and conscientious, cannot help but get highly aroused," believes the head of Bettinger Corporation, Robert Weaver. "This produces high spirited action, and shows his humaneness."

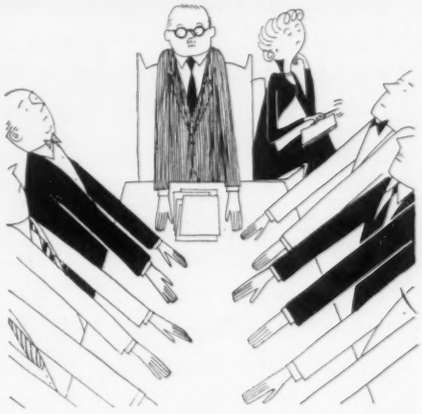
Brains alone can backfire; so support them with the controlled expression of aroused emotions. Your men will lift mountains for you.

Use, and you shall succeed

A low pressure, intellectual response: As others sweat, he comes through with a solution that he sells on its rational merits. If carried too far, he'll be labeled a cold fish.



This man has a day ahead of him in which he permits himself to be purposely aroused, and to show that arousal outwardly in a controlled manner. He knows that self-control is more than avoiding the upsets of the gentleman across the way. To him, self-control is becoming inwardly aroused, and channeling his feeling into an outward response that causes people to react the way he wants them to. Watch how he responds to his emotions.



An inactive response: A hesitant expression produces inaction in others—which, in this case, he wants. An extreme, though, and not as good as the next two.

A hot-headed response: Pounding the table (after he's counted to ten himself) he finds, gets instant inspired action from some individuals—but not all.

An enthusiastic response: Now he is reacting quite opposite to a brainy response. He persuades people not through cold logic, but the magic of "fun to do."

By now you've guessed his "secret." He uses his emotional energy to propel himself into various responses, depending on the case. He is a flexible actor.

Commercial movies are primarily intended to move a product or create good-will for the sponsoring company. But they can have a secondary purpose too: the training of sales personnel in the selling points of a new product line. Photo shows training session of Barber-Greene Co.

FILMS FOR SELLING

Increasing numbers of marketing managers are hopping aboard the commercial movie bandwagon. And there are some good reasons why.

THERE IS a fairly well-authenticated story—told among sales managers—about a $50,000 movie that was produced to be shown only once and to only one man. And, so the story goes, the film resulted in the sale of $22 million worth of railroad Diesel engines.

Accurate or not, this tale emphasizes the startling impact that a really good selling film, directed toward its proper audience, can have.

Marketing executives are aware of this. An estimated 100,000 motion pictures and slide-films on the topic of selling have been produced in the last 30 years.

Recently, their use has increased to the extent that about 20 million persons now see commercial movies every week. That's more than a third of the nation's weekly attendance at films produced solely for entertainment. Betty Grable, in short, is losing ground to General Motors.

Two comparatively recent developments point to even more commercial movie production—particularly of the type that tells an entertaining or enlightening story with the selling message either in the "public relations" category or brief and unobtrusive in nature.

The two developments are concurrent and related; but their effects on the burgeoning commercial film-making industry stem from opposite factors. The developments are:

- Expanding budgets in television; and
- Reduced expenditures in Hollywood.

Double Demand

Television, with its hundreds of brand-new stations and its many hours of daily programming to be filled, is eating up any available material like a ravenous lion. Company-sponsored films are more and more being used to fill the empty spaces—to practically everyone's satisfaction.

Hollywood, on the other hand, is suffering mightily from TV's competition and is cutting costs wherever it can. The sharpest paring (aside from big stars' salaries) is in the production of short subjects. (How long has it been since you've seen a Pete Smith short?)

Thus the film palaces across the country are eager for short features to exhibit along with the full-length Hollywood epics—and the free, or nearly free, commercially sponsored film is like manna from heaven.

TV stations and movie houses are not, of course, the only distribution outlets for commercial films. Sponsoring companies still depend largely on clubs, schools, churches, civic organizations, libraries, businesses, and labor unions to provide audiences for their films.

A management trying to decide whether or not to sponsor a film might first ask itself some questions:

1. Will we accomplish what we want to accomplish with such a movie?

Many selling films have failed because of an uncertainty about objectives; some have attempted too much, some too little.

If too much is attempted, perhaps a series of

films should have been considered. On the other hand, if the movie turns out to be much ado about very little, a slide-film might very well have been the wiser choice.

In some cases, of course, the entire idea should have been abandoned. Experts in the field agree that a movie should *not* be made:

- When the product doesn't lend itself to visual presentation;
- When the product requires personal persuasion or demonstration;
- When the potential audience for the film is too hard to pinpoint.

2. Should our film be frankly commercial or should it be designed simply to win good-will?

The "good-will" movie, of course, stands a much better chance of receiving a wide audience than does the direct-sell film. Yet the latter, if judiciously used on pinpointed audiences, can be a much more profitable project, especially if the product being advertised has a specialized set of users.

There's a middle way too. Many of the better production companies will assemble three or four versions of the same film, each designed for different audiences and purposes. Thus one version may last 25 minutes and be designed for movie theaters; another version may last only 13½ minutes and be offered to television stations; another 5-minute version may be ideal for dealer showrooms; and, finally, 60-second spot TV commercials might be extracted from the original footage.

3. How long will our movie last as an effective selling agent?

In other words, will the proposed movie still be useful one year, three years, or ten years from now? If the film's subject will be out of date in a few weeks or months, perhaps a motion picture is not the right vehicle.

4. Can we afford this film?

Film costs depend on:

- The producer selected;
- The techniques to be used (color or black-and-white; animated cartoons or stock footage; well-known actors or amateurs);
- The channels of distribution chosen;
- And, of course, the length of the movie.

The most common yardstick used to predict a professionally made film's cost is $1,000 a minute of showing time.

A handful of commercial films have cost as high as $150,000. But there are hundreds more on exhibition to-day that cost as little as $10,000. Most, however, are in the $20,000 to $35,000 bracket.

Partisans of motion pictures as an effective advertising medium claim that for a cost comparable to a spread in one weekly issue of one leading magazine, a sponsor's movie will tell his story to the public for from three to five years —and not just for a page-turning moment, but for 20 or 25 minutes at a time.

This presupposes, however, that the film gets its message across well and is exhibited to the right audiences—accomplishments more difficult

Projection booth at Barber-Greene auditorium is located to the side and rear of the stage. Window at left is equipped with vertical venetian blinds, masking audience's view of booth.

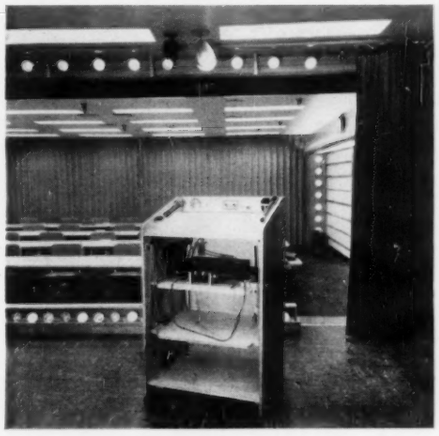
Movies spark Barber-Greene's sales training

Evidence of the increased use of films in the training of dealers and salesmen is the smartly up-to-date sales training auditorium recently unveiled by the Barber-Greene Co., Aurora, Ill., manufacturers of standardized material handling machines.

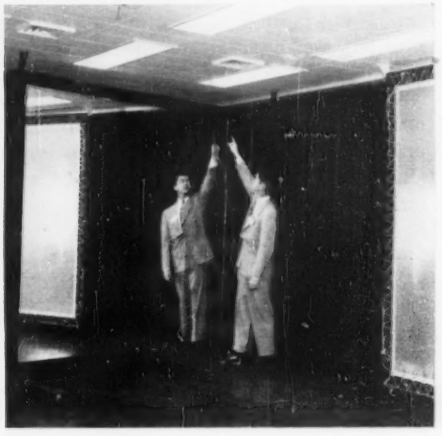
This company has assembled a multitude of visual training aids and techniques, ranging from a rear-projection device to "black light" spotlights which permit specially prepared material to glow with an eerie colored luminescence.

Barber-Greene is aware of the fact that movies can increase learning speed by 35 per cent; retention by 50 per cent.

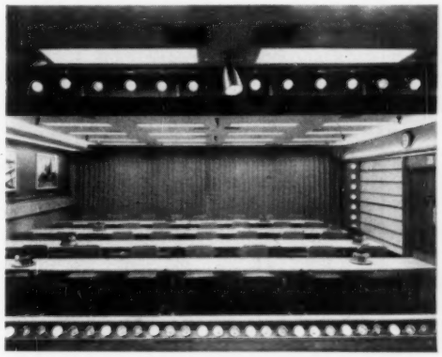
Movies, of course, represent only one segment of the broad area included in the general field of visual aids. There are other helpful devices.



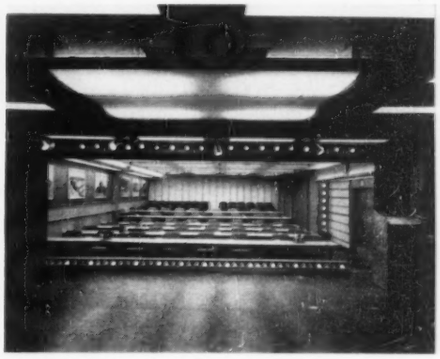
Electronic controls in speaker's rostrum include pointer projecting an arrow of light; a telephone with direct line to projector.



Moveable projection mirrors carry beams of any one of six different projectors onto translucent plastic screen, seen at the right.



When smaller assemblies are desired, auditorium may be reduced in size by closing sliding leather doors, cutting room in half.



Full auditorium accommodates larger classes. Translucent screen (at top) has been drawn up to the ceiling out of position.

to measure with films than with other advertising media.

Some companies that felt they couldn't afford that $25,000 or more tab have made attempts at producing their own movies with "home talent," sometimes for as low as $1,000. Such efforts, more often than not, fail miserably, unless the amateur producer's sights are kept very low. Slide-films, it is generally found, are better investments in this cost range.

False Economy

The painfully acquired knowledge and experience of a good professional producer will pay off both in economy and in more effective films. Almost everyone who has tried to produce a movie without previous experience has come to regret it.

5. Then which producer should we choose?

There are now about 50 leading production firms in the booming commercial film industry, most of which are located in New York, Hollywood, Chicago, Detroit, and other centers. But many smaller studios serve smaller communities from coast to coast.

Will A. Parker, president of Film Councilors, Inc., is not a producer himself but he and his firm act as management consultants on movie-making.

He strongly believes that the type of movie to be made should determine the choice of the producer, based on that producer's past output. One production company, for instance, might turn out superb public relations films, but go haywire on a direct-sell movie.

6. Once our film is made, how can we best distribute it?

If a local audience is all that's desired, the sponsoring concern can usually contact the previously mentioned outlets itself. But if national coverage is necessary, it's usually best for a company to place the distribution problem into the hands of organizations specializing in this. There are about five of these. The sponsor merely decides on the nature and size of the audience he wishes to reach, and, for a price, the distribution company does the rest.

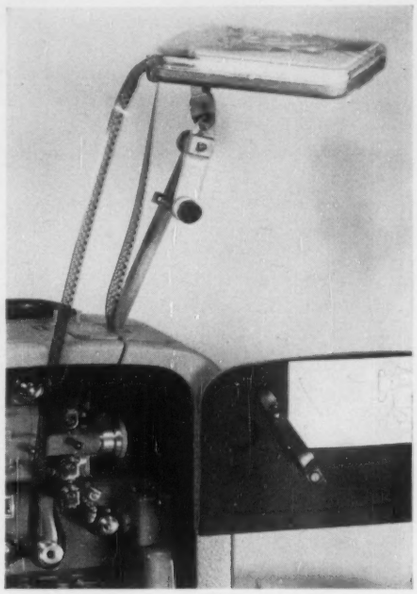
One additional audience should be kept in mind by a company in possession of a good selling film—the sales staff itself. What better means, for instance, of covering the selling points of a new product line?

It also has been found to be helpful in a number of ways if all employees are given an opportunity to view the company film. In addition, it is often an especially useful device for assisting in the orientation program set up for the benefit of new employees.

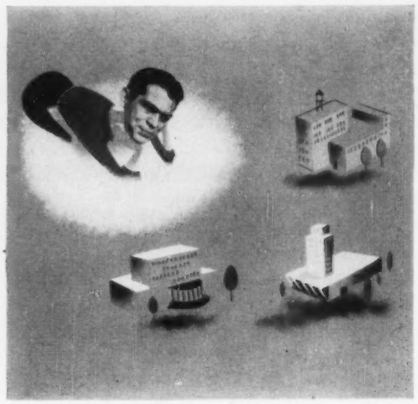
In summary, commercial movies should not be considered a panacea for all marketing headaches. But judiciously used in conjunction with other selling methods, they can eliminate a lot of red ink from the sales ledgers.

"Loop film" is new training device

Brand new in the sales training field is the loop film, developed by Seminar Films, Inc., New York. This consists of a continuously-running movie, which can be stopped and started with the press of a button by the instructor. In a series of short movies that Seminar made for Socony-Vacuum Corp., typical gas station customers appear on the screen and represent various degrees of sales resistance. Their remarks are interspersed with periods of silence, during which classes of gas station operators are urged to offer various sales approaches, "talking back," as it were, to the characters on the screen. In essence, the technique is simply a variation on rôle-playing, with one of the participants being an actor on celluloid. Various customer types are represented: a hard-boiled, impatient truckdriver; a flirtatious, attractive blonde; a nice old lady who "just can't afford" a new tire (or battery, or seat cover). Seminar Films reports a heavy demand for the films, expects them to gain popularity.



With special attachment, loop film can be shown continuously on ordinary projector.



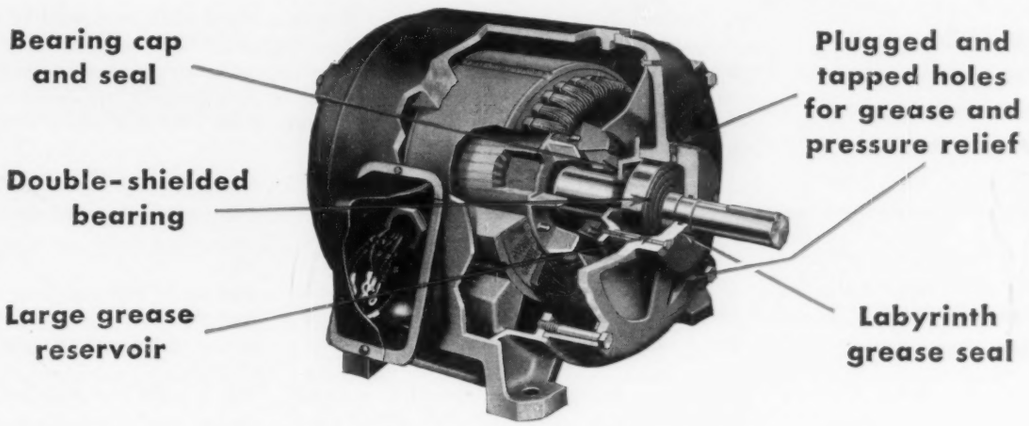
Film-makers like to experiment

Commercial film producers are blossoming forth right and left with new and original techniques, in many instances coming up with innovations ahead of Hollywood. In the field of animated cartoons, especially, the commercial movie-makers are introducing a number of novel and intriguing visual representation devices. The three pictures shown here are from a new employee relations film, "Add This To Your Pay," produced by On-Film, Inc., for Daystrom, Inc. The film makes use of "live" photographic faces combined with cartoon bodies.

Here Are Facts You Should Know About Electric Motor Bearings

An ideal motor bearing would operate for indefinitely long periods under all types of conditions without requiring any attention whatever. However, in the opinion of our engineers, such a bearing and its attendant lubricant are not yet available on the commercial market. Consequently, bearings for many types of operations, particularly where overloading, extreme temperature ranges and chemical and dirt laden atmospheres are involved, require special lubricants or regular lubrication schedules.

Of course, bearings suitable for many kinds of operation under normal conditions can be built to require no attention for very long periods — usually several years. Allis-Chalmers can supply sealed bearings in all frame sizes through 505 on short delivery and without extra cost for applications of this type.


Bearing cap and seal
Double-shielded bearing
Large grease reservoir
Plugged and tapped holes for grease and pressure relief
Labyrinth grease seal

Which is the Best Design for *Your* Application?

But, we believe that the design used in standard Allis-Chalmers drip-proof, tefc and explosion-proof motors represents the best design for most industrial users.

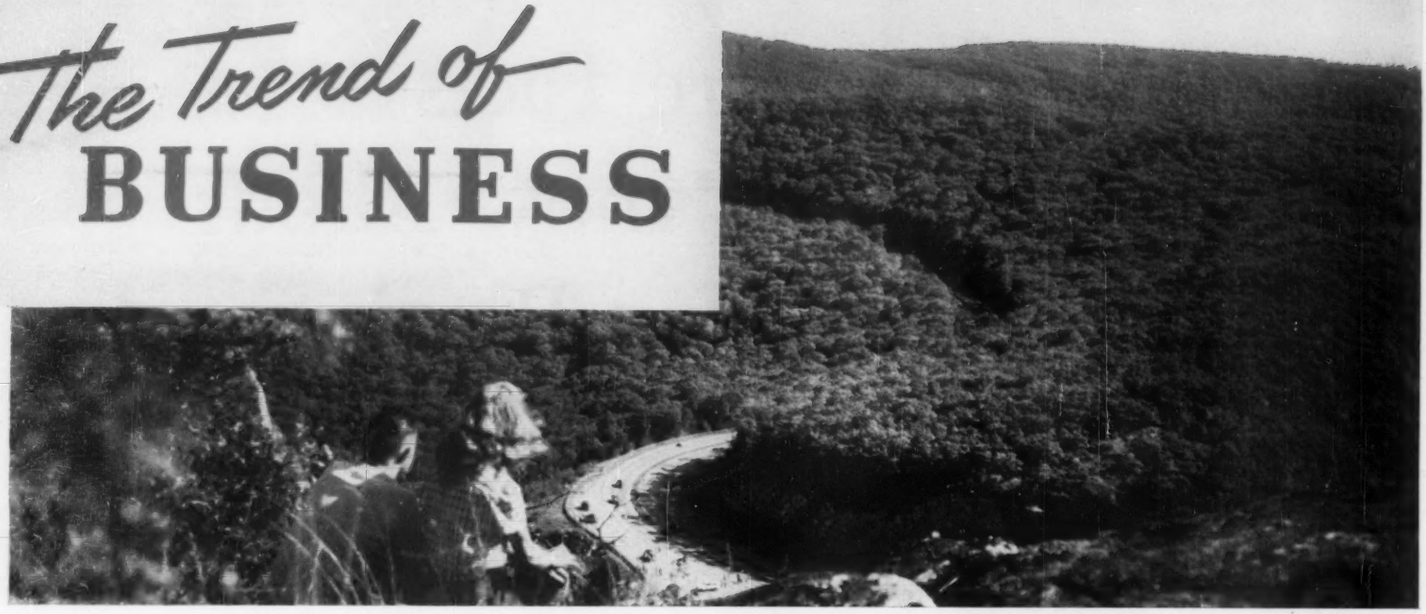
The Allis-Chalmers standard design consists of a pre-lubricated, double-shielded bearing mounted in the end housing with a generous grease reservoir. Plugged and tapped holes are provided for grease and for pressure relief. Under normal operating conditions, this design will operate as long without attention as any other type of bearing in use today. But where difficult operating conditions make re-lubrication desirable, it can be done as part of the normal lubricating-routine without dismantling the motor.

The large grease reservoir and shielded bearing design assure that grease lost from the bearing due to high operating temperatures or other causes will be replaced automatically.

For further information on bearing design and other features of Allis-Chalmers motors, call your nearby Allis-Chalmers District Office or Authorized Distributor. A-4130

ALLIS-CHALMERS

The Trend of BUSINESS



CUSHING PHOTOGRAPH

production
prices . . .
trade . .
failures .

Employment in the early Summer was close to a record level, supported by the unusually high tempo of production and an expanded scale of operations in agriculture and construction. Increased overtime at many factories helped to boost production workers' earnings. Increases in some prices offset declines in others, stabilizing the over-all averages. Retail trade remained above a year ago. Failures rose about 17 per cent.

THERE WAS a slight dip in industrial output in the early part of July, largely reflecting some reduced work schedules and scattered shutdowns for vacations. Compared with a year ago, when the steel strike was in its sixth week, over-all output was up noticeably.

The physical volume of industrial production in June remained on an unusually high plateau, estimated at 141 per cent above the pre-war average, according to the Federal Reserve Board's index. This was 18 per cent above a year ago.

Steel ingot production averaged close to 2.2 million tons a week in June, more than six times as large as in the strike-bound month last year. For the first half of 1953, the output of steel reached a new record of 58 million tons, the most ever produced in any half-year period.

Industry observers expect that steel production will be scheduled close to record levels in the Summer months. The mills reportedly have a substantial volume of unfilled orders, averaging four to five months of output at current rates of production.

A reduction in orders for some special kinds of steel used in jet engines and for atomic energy installations resulted from the stretching out of the defense program. While the general demand for stainless and other alloy steels remained very large, the pressure for immediate deliveries slackened noticeably. Steel inventories appeared to be increasing in some lines in physical, as well as dollar, volume.

The peaceful settlement of the steel wage negotiations this year was followed by a slight reduction in the rate of operations so that some furnaces could be shut down for repairs. But output remained within 5 per cent of the March all-time monthly peak.

The average weekly output of bituminous coal in June was 7 per cent above that in May and 21 per cent above a year ago. Freight carloadings of coal in the first half of 1953 were roughly 10 per cent below the 1952 comparative, while production for the same period was down 7 per cent from the 1952 level.

Total freight carloadings in the first half of 1953 were about 1 per cent above the year-ago level. The declines in the shipments of coal, livestock, and grain contrasted with increases in coke, ore, and forest products.

Although operations at some assembly plants were either curtailed or suspended because of the strike at Borg Warner's important transmission and parts factory, the output of automobiles in June, at about 600,000 vehicles, was less than 6 per cent below the May level. Production was still impressively higher than a year ago, with a 25 per cent gain in output. The gains from a year ago in July and August may be even more spectacular since last year's steel strike seriously hampered automobile assemblies in the Summer of 1952.

The heavy use of air conditioning and other cooling equipment, particularly in the South, coupled with the higher level of industrial activity, boosted electric power production 15 per cent above a year ago in June and early July. The rise in electric energy distribution was contrary to the usual tendency at this time of year.

Spending for new construction increased again in June; at $3.2 billion, outlays for new building were 8 per cent above a year ago. There were an estimated 103,000 dwelling units started in June, some 500 units fewer than in the same month a year ago. Housing starts had dipped contra-seasonally in May.

Building permits, which tend to precede by two or three months the movement in construction activity, dipped 2 per cent to $455.2 million in June. They were, however, almost 18 per cent above a year ago.

Several mortgage guarantee and insurance programs were extended for another year in a law signed by the President on June 30. The new legislation increased by $1.5 billion the present $13.2 billion authorized for the Federal

Continued on page 71

Housing Administration mortgage insurance program. The legislation permits the President to reduce to as low as 5 per cent the down-payment requirements on mortgages insured by the FHA, or guaranteed by the Veterans Administration. He may also extend the period of payment to 30 years from the 25 at present.

The output of non-durable goods remained close to May's record high. Textiles production continued to expand, reflecting the substantial gain in the output of wool cloth. The paper and rubber industries scheduled production at a high level and there was a further rise in the rate of activity at the chemicals factories.

Labor and Wages Employment rose sharply in June and early July as large numbers of students found jobs at the close of the school term. Agricultural employment advanced markedly to almost 8 million persons; the weather in most parts of the country favored a full-scale expansion in outdoor farm activity. Non-agricultural employment was high and steady at 55.2 million, slightly above last year's level.

The jobless remained unusually few; at 1.6 million they were 14 per cent less numerous than a year ago. The unemployed continued to constitute about 2 per cent of the labor force, about the same as in June.

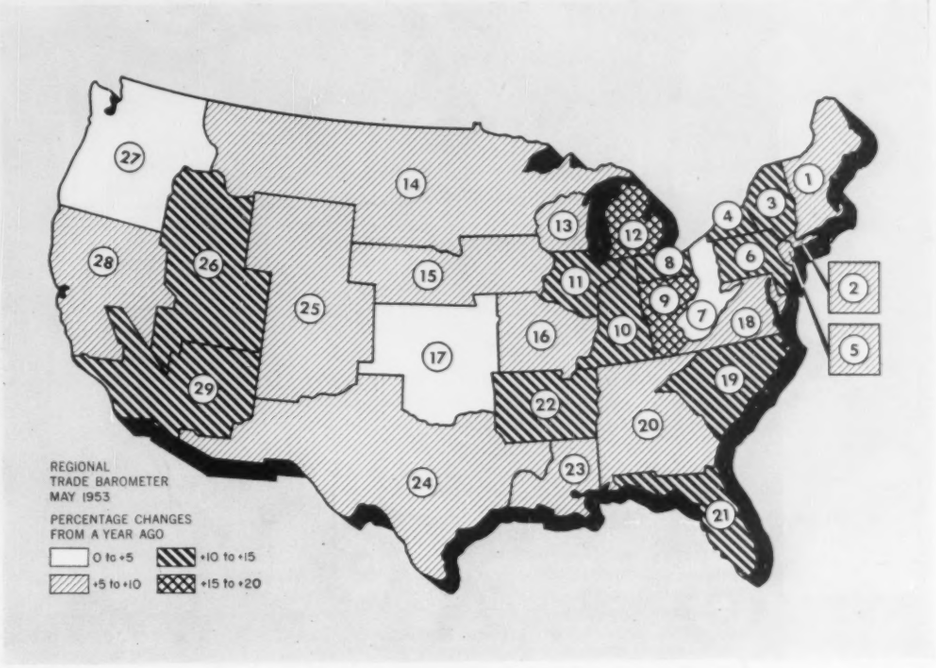
Basing their opinions on what has happened so far in 1953, Government and labor experts think that strikes may be less upsetting to the economy this year than in any other year since the war. Untroublesome labor relations in the steel, electrical, oil, and automobile industries appear likely for the rest of 1953. Because of an increase in the number of small local disputes, strikes were but 6 per cent fewer than a year ago in the first five months of 1953, although the number of workers involved and the man-hours lost were half as large as a year ago.

Major disturbances were still a possibility in the railroad and coal industries. The contracts between John L. Lewis and the coal operators can be terminated on October 1, at the earliest, although the contracts will remain in force if neither side acts. With inventories very high, some of the coal operators have talked of wage reductions, even at the price of a strike. The labor relations picture at the New York waterfront is clouded by the American Federation of Labor's difficulties with the International Longshoremen's Union.

Overtime work continued to be widespread in manufacturing in June. The factory work week remained close to peacetime peak levels. Factory workers' gross hourly earnings, including overtime and other premium pay, averaged $1.75 at mid-May. The average factory worker earned $71.05 a week in May, almost $5 more than a year ago. Total personal income was at an annual rate of $283.8 billion in May, 7 per cent higher than the same month in 1952.

Regional Trade Barometers

(1947-1949=100)

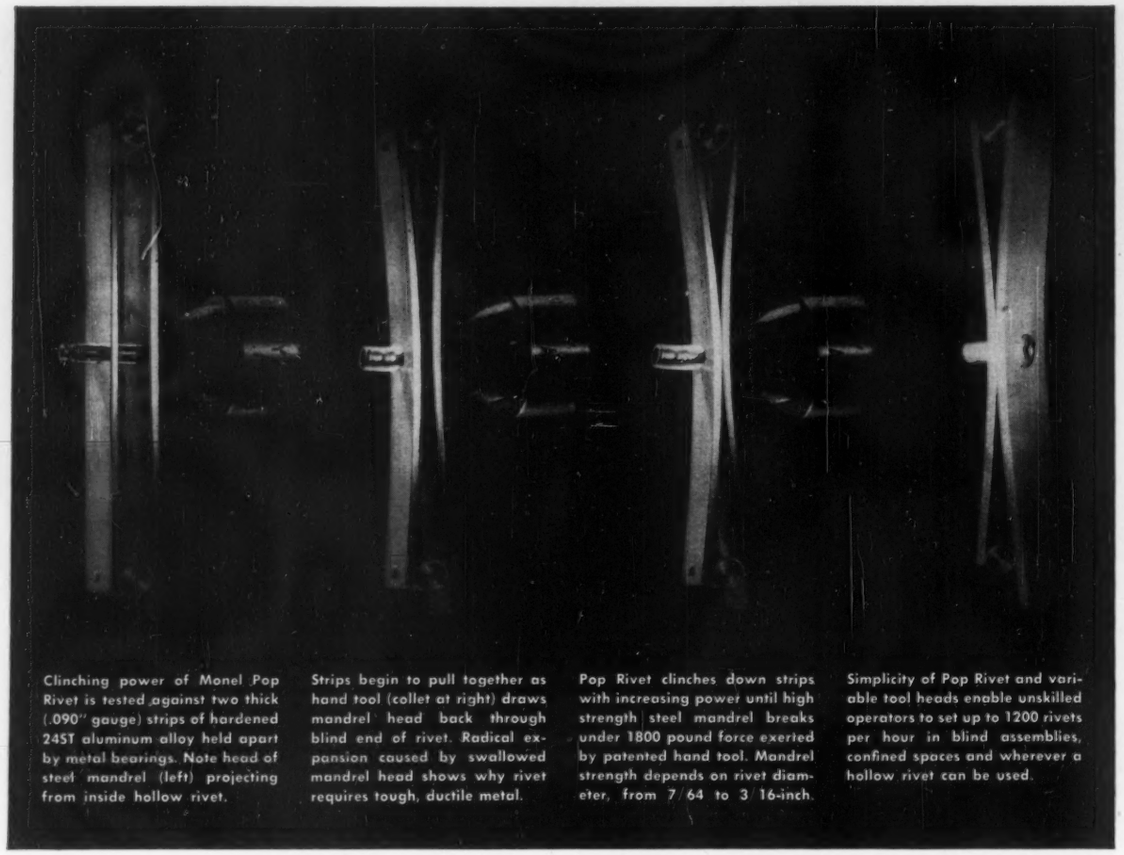


		% Change from	
	May 1953	May 1952	April 1953
United States	136.5	+ 9.0	+2.5
1. New England	117.5	+ 5.7	+1.7
2. New York City	126.7	+ 5.8	+0.8
3. Albany, Utica & Syracuse	137.1	+12.0	+8.7
4. Buffalo & Rochester	141.4	+14.8	+3.4
5. Northern New Jersey	129.4	+ 7.3	−3.0
6. Philadelphia	129.3	+11.1	+4.5
7. Pittsburgh	138.2	+ 4.9	+0.9
8. Cleveland	144.8	+13.0	+3.7
9. Cincinnati & Columbus	140.2	+15.4	+3.5
10. Indianapolis & Louisville	144.1	+14.6	+1.5
11. Chicago	131.6	+13.4	+0.5
12. Detroit	138.4	+18.8	−0.2
13. Milwaukee	137.0	+ 9.5	+0.4
14. Minneapolis & St. Paul	120.0	+ 5.2	+7.3
15. Iowa & Nebraska	122.6	+ 5.1	+1.2
16. St. Louis	128.1	+ 9.4	+1.7
17. Kansas City	132.9	+ 5.7	+1.5
18. Maryland & Virginia	139.0	+ 9.9	+3.6
19. North & South Carolina	144.8	+11.9	+5.9
20. Atlanta & Birmingham	141.9	+ 7.7	+0.6
21. Florida	147.1	+10.0	+1.4
22. Memphis	132.2	+10.7	+3.4
23. New Orleans	134.3	+ 6.3	+2.7
24. Texas	148.8	+ 6.6	+0.1
25. Denver	130.1	+ 5.2	−1.3
26. Salt Lake City	133.4	+10.2	+9.3
27. Portland & Seattle	125.9	+ 4.7	−2.8
28. San Francisco	131.2	+ 6.5	+4.5
29. Los Angeles	147.3	+14.5	+1.4

Prices Advances of about 4 per cent in the prices for steel and 10 per cent in crude oil had little effect on the general price level in June and early July. The Dun & Bradstreet index of spot commodity prices was at an average level of 279.26 in the first half of July, close to that in June, but 4 per cent below a year ago. The index is based on the daily spot closing prices of 30 basic commodities in primary markets and is expressed as a percentage of the 1930-1932 average.

There was little evidence that the steel price boost would be passed on by manufacturers of appliances and automobiles. Strong competition, coupled with enlarged productive capacity, seemed likely to restrain any inflationary tendencies which might develop. Except for gasoline, where the demand was at a seasonal peak, the higher price line for refined petroleum products wavered noticeably. Buyers of heating oils and kerosene, already heavily stocked in an off season, were strongly resistant to the advance; it was not long before those two products could be bought at a reduction in the spot market.

The few signs of price strength were counterbalanced by some weakness in farm prices. The Southwestern drought was a telling blow to many producers of cattle, cotton, and livestock feed, with varying repercussions on prices. While this year's drought was confined to a smaller area than last year's, the heat wave broke records for duration and intensity. As the water supply dwindled and the grass dried up, many Southwestern ranchers were forced to sell their cattle. As a result, the prices of some of the less desirable grades of beef fell to the lowest levels in over seven years, down about 50 per cent from those in the early part of this year. In an attempt to halt the decline in cattle prices, the Govern-



Clinching power of Monel Pop Rivet is tested against two thick (.090" gauge) strips of hardened 24ST aluminum alloy held apart by metal bearings. Note head of steel mandrel (left) projecting from inside hollow rivet.

Strips begin to pull together as hand tool (collet at right) draws mandrel head back through blind end of rivet. Radical expansion caused by swallowed mandrel head shows why rivet requires tough, ductile metal.

Pop Rivet clinches down strips with increasing power until high strength steel mandrel breaks under 1800 pound force exerted by patented hand tool. Mandrel strength depends on rivet diameter, from 7/64 to 3/16-inch.

Simplicity of Pop Rivet and variable tool heads enable unskilled operators to set up to 1200 rivets per hour in blind assemblies, confined spaces and wherever a hollow rivet can be used.

A blind rivet

that may open your eyes

Maybe you have a product that isn't performing the way you want it to. And maybe your problem is to find the right metal.

The makers of "pop" rivets had just such a problem.

Here they'd come up with a wonderful idea — a rivet that could be set from one side of the work simply by yanking a steel mandrel through its hollow body. The "pop" rivet would do things no other rivet on the market would do so well, or so inexpensively. Still, it wasn't quite right for *every* job...

What they needed was a metal strong enough to clinch tightly and *stay* tight... ductile enough to "upset" and form a head properly... resistant enough to give the back of its hand to corrosives.

Of course, a single metal with all these advantages isn't too easy to find. The manufacturers had tried other metals before they tried Monel®. But they didn't have to try any others *afterward*. Monel was their answer; it had every characteristic needed.

Does this rivet maker's success open your eyes to a new possibility for solving some problem of your own by using Monel or another INCO Nickel Alloy? Let's work it out together.

The International Nickel Company, Inc.
67 Wall Street, New York 5, N. Y.

"Pop" Rivets, long known as Tucker Blind Rivets in Great Britain, are now being produced in the U. S. for the first time by J. C. RHODES & COMPANY, branch of UNITED SHOE MACHINERY CORP., New Bedford, Mass.

Inco Nickel Alloys MONEL® • "R"® MONEL • "K"® MONEL • "KR"® MONEL • "S"® MONEL INCONEL® • INCONEL "X"® • INCONEL "W"® • INCOLOY® • NIMONIC® ALLOYS NICKEL • LOW CARBON NICKEL • DURANICKEL®

INCO TRADE MARK

ment announced a 200 million pound beef buying program at the end of June, and various other relief measures were put into effect.

Reports of drought damage helped to strengthen the prices for corn and cotton. Contrastingly, the improved crop prospects for rye and oats resulted in a slight weakening in their prices.

The rise in coffee prices appeared due to slacken. It was forecast that Brazil's exportable coffee output for the year ahead might rise 7 per cent above current levels. And the consumer could expect to pay more for fewer olives from Spain, our principal supplier, in the latter part of this year. Hail storms reduced the olive crop prospects by almost half and Spain has no carryover from previous crops.

The prices paid by consumers continued to edge upward in June and early July. Although farm prices were generally down, higher processing and transportation charges kept food prices high at the stores.

Trade Retail volume was estimated at 5 per cent above a year ago in the early part of July. The usual Summer slackness at retail was counteracted to some extent by early clearances of seasonal merchandise and the continued strong reliance on easy credit terms. Suburban stores continued to chalk up larger year-to-year gains than did large city department stores located in business districts.

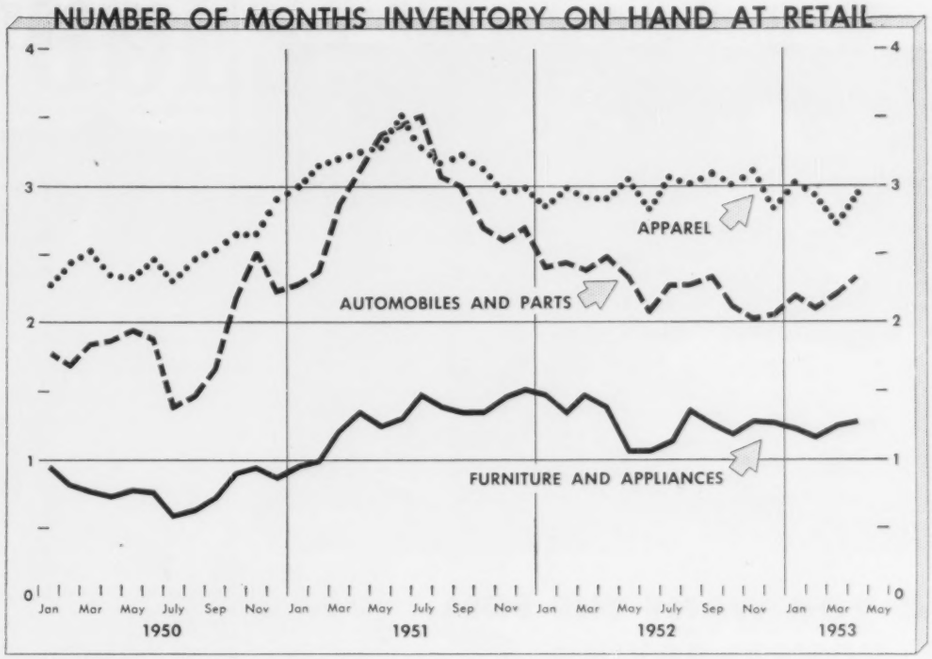
While new cars were still selling unusually well, dealers experienced increased difficulty in disposing of used cars. Consumers bought home cooling equipment in substantially larger volume than a year ago. Outdoor furniture and camping supplies were popular, in contrast with a detectable softening in the call for television sets, some major appliances, and indoor furniture.

Apparel sales continued to exceed the year-ago level. Some retailers found themselves with inadequate stocks to meet the increased interest in lightweight clothing. Volume in men's wear was stimulated noticeably by the increased use of blended fabrics in suits.

Housewives spent slightly more for food than a year ago. The expanded buying of canned meats, fresh fruits and vegetables, and bottled beverages reflected the usual seasonal shift in consumers' preferences. But there were frequent reports that frozen vegetables often sold better than their less-expensive, fresh counterparts.

The dollar volume of retail trade in June was estimated at $14.0 billion some 4 per cent above the 1952 comparative. Retailers' inventories, at $21.8 billion, were in slightly higher ratio to sales than they were a year ago.

Wholesale trade in early July slightly surpassed last year's level. Buyer attendance was high at the apparel centers as many stores sought both to enlarge their inadequate stocks of Summer clothing and place initial orders for Fall apparel. The advance orders for Fall were substantial and buyers seemed less hesitant than in some previous years.



Although competition sharpened noticeably this Spring, inventories generally were well geared to sales, except for used cars and television sets. Used car stocks rose 13 per cent in the first five months of 1953, while sales dropped 15 per cent; in the same period of 1952, when new car output was restricted, used car stocks fell 3 per cent, sales rose 42 per cent. Consumers had to be coaxed with price cuts and special deals to buy new TV sets. The producers rolled out almost 4 million sets in the first half-year, planned to better 1950's record of 7.4 million in 1953.

Barometers Reflecting a slight dip in consumer spending, the Regional Trade Barometer for June decreased 1 per cent to 134.3 (preliminary). This was 7 per cent above a year ago. The barometer is adjusted for seasonal variation and for the number of business days in the month.

The United States index for May was at 136.5, up 9 per cent from the 1952 level. There were increases from last year in each of the 29 regions. Compared with May 1952, gains of more than 10 per cent were registered in thirteen of the regions. The largest increase, amounting to almost 19 per cent, was recorded for the Detroit Region (12).

The smallest rise from a year ago was recorded in the Kansas City Region (17) where consumer spending was up 3.7 per cent. Increases of less than 5 per cent were reflected in the barometers for two other regions, the Pittsburgh Region (7) and the Portland and Seattle Region (27).

The United States barometer for May was 2.5 per cent above that in the previous month. Increases of more than 5 per cent from a month ago were found only in the Minneapolis and St. Paul Region (14), the North and South Carolina Region (19), and the Salt Lake City Region (26).

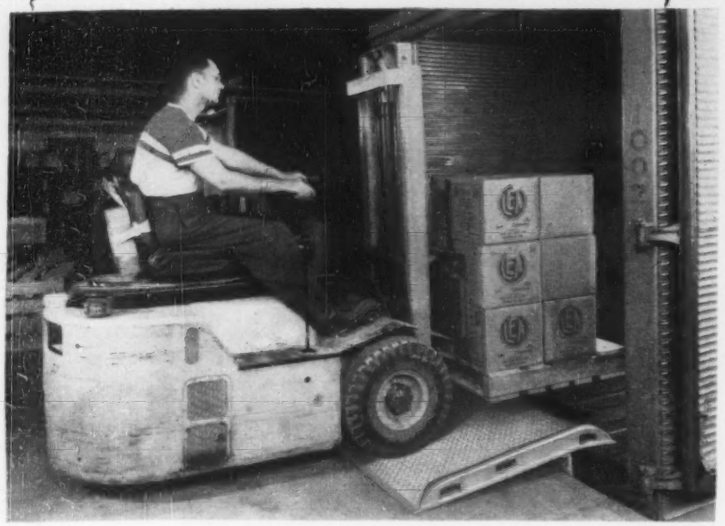
Finance At the latest reckoning of consumers' short-term debts, it appeared that they owed a record $26.7 billion at the end of May, or 20 per cent more than a year ago. In the year since Government controls on

Weekly Business Signposts

SELECTED BUSINESS INDICATORS	LATEST WEEK*	PREVIOUS WEEK	YEAR AGO
Steel Ingot Production Ten Thousand Tons	217	209	32
Bituminous Coal Mined Hundred Thousand Tons	16	101	11
Automobile Production Thousand Cars and Trucks	159	132	62
Electric Power Output Ten Million K.W. Hours	797	845	645
Freight Carloadings Thousand Cars	670	818	447
Department Store Sales Index Number (1947–1949=100)	118	112	111
Wholesale Prices Index Number (1947–1949=100)	110	109	111
Bank Clearings Hundred Million Dollars	170	186	144
Money in Circulation Hundred Million Dollars	303	302	291
Business Failures Number of Failures	139	169	156

*Steel, automobile, price and failures data are for the third week of July; all other figures are for the second week. *Sources:* Amer. Iron & Steel Inst.; U. S. Bureau of Mines; Automotive News; Edison Electric Inst.; Amer. Assoc. of Railroads; U. S. Bureau of Labor Statistics; Dun & Bradstreet, Inc.

LOOKING INTO THE FACTS . . . LEADS INEVITABLY TO **MAGCOA**



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The Trend of BUSINESS

continued

installment credit were eliminated, consumer credit outstanding rose by almost $5 billion, compared with a rise of less than $0.7 billion in the preceding twelve months when restrictions were in effect.

The turnover of shares on the New York Stock Exchange dwindled perceptibly in early July, although price changes were negligible. Trading volume for the month of June was slightly above the levels of both the preceding month and a year ago.

Failures

A considerable rise in June carried business failures to 817, the highest toll in over three years. The increases lifted casualties 22 per cent above the comparable month a year ago to a level exceeded in only one June, 1949, since pre-war 1941.

The rate of failure, as reflected in DUN'S FAILURE INDEX, climbed to 35.8 for each 10,000 enterprises listed in the DUN & BRADSTREET *Reference Book*. The index extends monthly mortality to an annual rate and adjusts for seasonal fluctuations. The June failure rate was the severest recorded for any month since August 1950, but it remained well below the 55 failures for each 10,000 listed businesses which occurred in June 1941.

The liabilities involved in June failures were steady at the high level established in the preceding month; they totalled $32,379,000. Half again as heavy as a year ago, they represented the largest volume for any June since 1934.

Except for a dip among casualties with liabilities of $100,000 or more, failures of all sizes increased from the previous month and a year ago.

WHOLESALE FOOD PRICE INDEX

The index is the sum total of the prices per pound of 31 foods in general use. It is not a cost-of-living index.

Latest Weeks		Year Ago		1953	
July 14	$6.74	July 15	$6.61	High July 7	$6.62
July 7	6.62	July 8	6.51	Low Feb. 3	6.13
June 30	6.54	July 1	6.45	1952	
June 23	6.57	June 24	6.39	High Aug. 26	$6.70
June 16	6.51	June 17	6.41	Low Dec. 16	6.11

DAILY WHOLESALE PRICE INDEX

The index is prepared on the basis of daily spot closing prices of 30 primary commodities (1930–1932 = 100).

Week Ending:	Mon.	Tues.	Wed.	Thurs.	Fri.
July 10	277.81	278.33	279.76	280.06	280.02
July 3	275.99	275.81	276.09	277.32	277.35
June 26	275.84	276.58	276.12	277.02	276.10
June 19	274.02	274.53	275.86	276.76	276.73
June 12	276.50	276.32	276.64	277.11	276.05

Industrial Production

Seasonally Adjusted Index: 1935-1939=100; Federal Reserve Board

	1950	1951	1952	1953
January	183	221	221	236
February	189	222	221	239
March	187	222	221	241
April	199	223	216	241
May	195	222	216	241
June	198	221	216	241†
July	205	212	193	
August	209	217	214	
September	211	219	226	
October	216	218	229	
November	215	219	233	
December	218	218	235	

† Approximation; figure from quoted source not available.

Consumers' Price Index

Index: 1947-1949=100; U. S. Bureau of Labor Statistics

	1950	1951	1952	1953
January	100.6	108.6	113.1	113.9
February	100.4	109.9	112.4	113.4
March	100.7	110.3	112.4	113.6
April	100.8	110.4	112.6	114.7
May	101.3	110.5	113.0	114.0
June	101.8	110.8	113.4	114.2†
July	102.8	110.9	114.1	
August	103.7	110.9	114.3	
September	104.4	111.6	114.1	
October	105.0	112.1	114.2	
November	105.5	112.8	114.3	
December	106.9	113.1	114.1	

† Approximation; figure from quoted source not available.

Wholesale Commodity Prices

Index: 1947-1949=100; U. S. Bureau of Labor Statistics

	1950	1951	1952	1953
January	97.7	115.0	113.0	109.9
February	98.3	116.5	112.5	109.6
March	98.5	116.5	112.3	110.0
April	98.5	116.1	111.8	109.4
May	99.6	115.9	111.8	109.8
June	100.2	115.1	111.2	109.5†
July	103.9	114.2	111.8	
August	106.2	113.7	112.2	
September	107.1	113.4	111.7	
October	107.7	113.7	111.1	
November	109.3	113.6	110.7	
December	112.1	113.5	109.6	

† Approximation; figure from quoted source not available.

Industrial Stock Prices

Monthly Average of Daily Index: Dow Jones

	1950	1951	1952	1953
January	199.79	244.45	271.71	288.44
February	203.46	253.32	265.19	283.94
March	206.30	249.59	264.48	286.79
April	212.67	253.36	262.55	273.27
May	219.36	254.36	261.61	276.84
June	221.02	249.32	258.06	281.67
July	225.30	256.03	276.03	
August	230.60	264.02	276.70	
September	229.[illegible]	273.36	272.40	
October	230.[illegible]	269.73	267.77	
November	224.38	259.61	276.36	
December	229.26	266.09	285.05	

Based on closing prices of 30 industrial stocks.

Employment

Millions of Persons; U. S. Bureau of the Census

	1950	1951	1952	1953
January	56.9	59.0	59.7	60.5
February	57.0	58.9	59.8	60.9
March	57.6	60.2	59.7	61.5
April	58.7	60.0	60.1	61.2
May	59.7	61.2	61.2	61.7
June	61.5	61.8	62.6	63.2
July	61.2	62.5	62.4	
August	61.2	62.4	62.4	
September	61.2	61.6	62.3	
October	61.8	61.8	61.9	
November	61.3	61.3	62.2	
December	60.3	61.0	61.5	

Includes all civilian workers.

Retail Sales

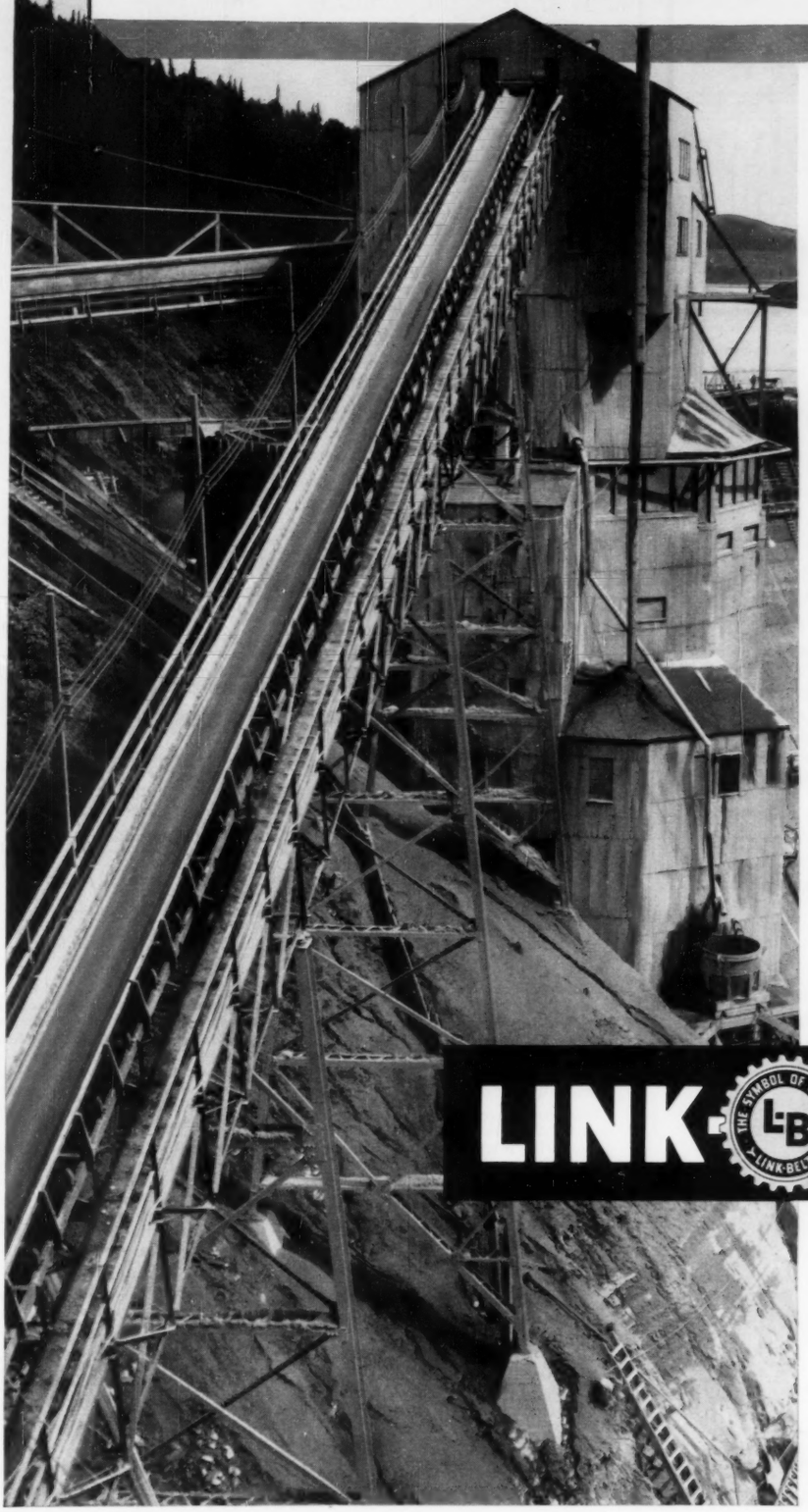
Billions of Dollars; U. S. Department of Commerce

	1950	1951	1952	1953
January	9.7	12.6	11.8	13.1
February	9.9	11.7	11.7	12.3
March	11.3	13.4	12.7	13.9
April	11.4	12.5	13.4	14.3
May	11.9	13.5	13.4	14.7
June	12.3	13.4	13.4	14.4†
July	12.1	13.4	13.4	
August	11.[illegible]	13.1	13.4	
September	12.5	13.1	13.6	
October	12.4	13.9	14.8	
November	11.9	13.4	14.0	
December	14.8	15.4	16.9	

† Approximation; figure from quoted source not available.

LINK-BELT RESEARCH AND ENGINEERING . . . WORKING FOR INDUSTRY

UP IT GOES! 900 tons per hour



Here's how belt conveyor transportation cuts construction costs

In the photograph at left, a Link-Belt belt conveyor carried 900 tons per hour of sand and aggregate to a huge dam's mixing tower. Working continuously—without loading and unloading delays . . . with no loss of time for empty return trips—belt conveyors travel up or down grades as steep as 32 percent. Their light, compact structures cross mountains and marshes . . . travel over rivers, above city streets, through small tunnels.

The long-distance movement of materials to and from large construction jobs is just one example of their versatility. You'll find Link-Belt belt conveyors at work in mines and quarries . . . in foundries, mills and factories . . . loading and unloading boats and trains. In every case, high capacity goes hand-in-hand with low operating and maintenance costs.

At this very moment, new applications for belt conveyors are being explored as modern industry's tonnage requirements outgrow traditional means of transportation. And, as in so many industrial "revolutions," Link-Belt research and engineering are making far-reaching contributions. In fact, in almost any plant you visit, you can see evidences of Link-Belt developments that make the movement of materials and the mechanical transmission of power more efficient.

13,321

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307 N. Michigan Ave., Chicago 1, Ill.
Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle; Scarboro, Toronto and Elmira, Ont. (Canada); Springs (South Africa); Sydney (Australia).
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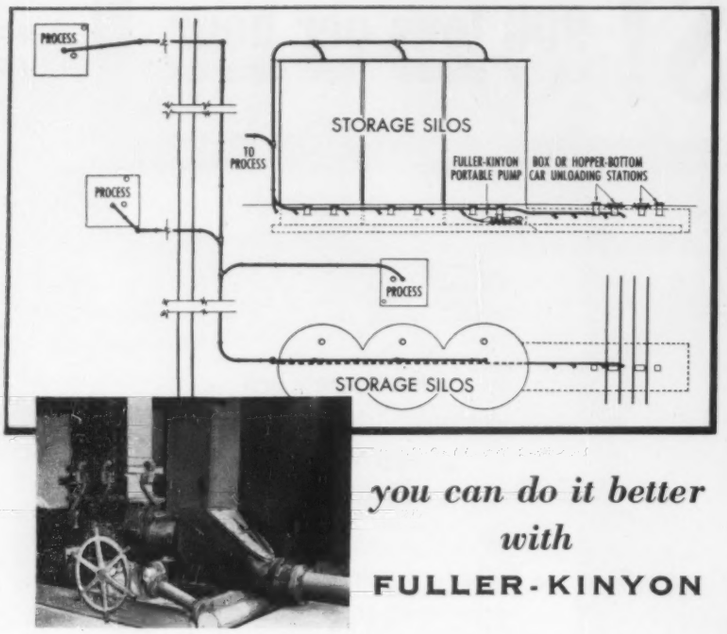
ONE SOURCE—ONE RESPONSIBILITY FOR MATERIALS HANDLING AND POWER TRANSMISSION MACHINERY



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FULLER-KINYON

Deep in the heart of Texas, this Fuller-Kinyon Conveying System is at work handling bulk shipments of pulverized phosphate rock from cars to storage, for a prominent chemical company.

This same portable Fuller-Kinyon Pump, in addition to unloading from box or hopper-bottom cars, on adjacent tracks, and delivering to any one of three storage silos, can be moved on a track to positions underneath these silos. Connection is easily and quickly made to the silo to be emptied and material conveyed to any one of three widely separated process points in the plant. Advance designing makes this dual use of the Fuller-Kinyon Pump feasible.

Conveying is done at the rate of 50 tons an hour, with the longest conveying distance approximately 690 feet; together with branch lines making a total of about 1070 feet.

A Fuller Rotary Single-stage Compressor furnishes the necessary air to the Fuller-Kinyon Pump for conveying.

If you handle bulk shipments of dry, pulverized materials it will be worth your while to learn about Fuller air conveying systems now. Write today!

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DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS AND ASSOCIATED EQUIPMENT

P-144
2108

The Trend of BUSINESS

continued

The sharpest relative rise appeared in the $25,000 to $100,000 liability class where mortality reached a 20-year peak.

While there was an increase in failures from the previous month in all industry and trade groups, the most notable upturns took place in construction, which had the highest number of failures in any month on record, and in retail trade, where casualties were the heaviest since 1950.

All retail lines except general merchandise and automotive had more failures than a month ago. An especially sharp increase occurred among furniture stores which suf-

NEW BUSINESS INCORPORATIONS

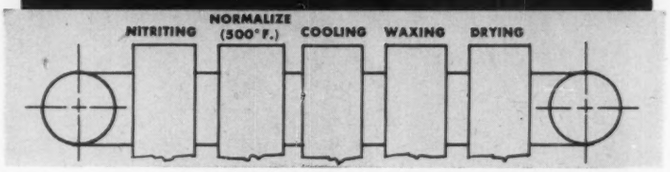
Geographical Divisions:	May		Five Months	
	1953	1952	1953	1952
New England	576	493	2,985	2,485
Middle Atlantic	2,896	2,781	15,065	13,844
East North Central	1,473	1,199	7,526	6,107
West North Central	453	374	2,268	1,858
South Atlantic	1,301	1,098	6,675	5,728
East South Central	263	207	1,283	1,156
West South Central	591	546	2,873	2,694
Mountain	375	356	1,780	1,496
Pacific Coast	1,040	861	5,090	4,238

FAILURES BY DIVISIONS OF INDUSTRY

(Current liabilities in thousands of dollars)	Number 6 Months		Liabilities† 6 Months	
	1953	1952	1953	1952
MINING, MANUFACTURING	844	834	65.5	56.8
Mining—Coal, Oil, Misc.	21	21	0.9	1.7
Food and Kindred Products	81	103	8.4	8.2
Textile Products, Apparel	206	202	12.7	9.6
Lumber, Lumber Products	119	117	6.2	6.2
Paper, Printing, Publishing	60	53	8.7	2.6
Chemicals, Allied Products	33	28	4.2	2.8
Leather, Leather Products	50	46	4.0	2.1
Stone, Clay, Glass Products	20	22	0.8	1.3
Iron, Steel, and Products	25	24	3.9	2.0
Machinery	69	65	7.9	10.5
Transportation Equipment	21	23	1.9	1.3
Miscellaneous	139	130	5.6	8.4
WHOLESALE TRADE	447	406	23.8	17.5
Food and Farm Products	128	130	6.3	7.0
Apparel	18	26	0.5	0.9
Dry Goods	17	22	0.9	0.7
Lumber, Bldg. Mats., Hdwr.	40	32	4.2	2.0
Chemicals and Drugs	17	12	0.7	0.8
Motor Vehicles, Equipment	22	12	0.7	0.2
Miscellaneous	205	172	10.5	5.8
RETAIL TRADE	2,150	2,071	55.4	40.6
Food and Liquor	443	493	7.0	7.4
General Merchandise	77	75	1.8	2.2
Apparel and Accessories	319	327	9.0	6.0
Furniture, Furnishings	330	233	12.0	5.6
Lumber, Bldg. Mats., Hdwr.	108	94	3.8	2.2
Automotive Group	240	164	6.4	3.6
Eating, Drinking Places	372	455	8.6	8.9
Drug Stores	59	56	2.1	0.8
Miscellaneous	202	174	4.7	3.9
CONSTRUCTION	504	456	19.1	16.6
General Building Contractors	186	168	8.5	8.5
Building Sub-contractors	291	268	8.0	7.2
Other Contractors	27	20	2.6	1.0
COMMERCIAL SERVICE	339	327	10.5	15.4

†Liabilities in thousands of dollars

CAMBRIDGE WIRE MESH BELTS help spring producer boost output 350% in 30% less floor space!



110 old-fashioned hand trucks no longer needed! 15 truck operators freed for more productive work! Floor space requirements cut by 30%. Output rose from 290,000 pieces in 24 hours to 680,000 pieces in 16 hours, *an hourly increase of 350%*.

These were the results of this installation of a 98′ Cambridge wire mesh belt in a large spring producing plant. The moving belt gives continuous production, eliminates the need for hand trucks in transferring the work from one step to the next, assures uniformly processed work.

Perhaps Cambridge wire mesh belts can help you get similar savings. They're available in any metal or alloy, mesh or weave, length or width. They can be used under practically any conditions . . . from temperatures as high as 2100° F. down to sub-zero, for handling work through simple water rinses or highly corrosive acid sprays, for carrying small delicate parts or heavy, bulky loads. All-metal belt construction assures long life and freedom from damage. Open mesh permits free drainage of process solutions or free circulation of process atmospheres.

Why not call in your Cambridge field engineer? You can rely on his experienced advice to recommend the right type of wire mesh belt for your process. Look under "Belting-Mechanical" in your classified phone book for the Cambridge office nearest you.

Cambridge Duplex Weave, one of the most widely used specifications for continuous heat treating.

FREE BELT MANUAL tells how Cambridge belts can be used in your industry. Also includes useful data on conveyor design, metallurgical tables and belt specifications. Write for your copy today.

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WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

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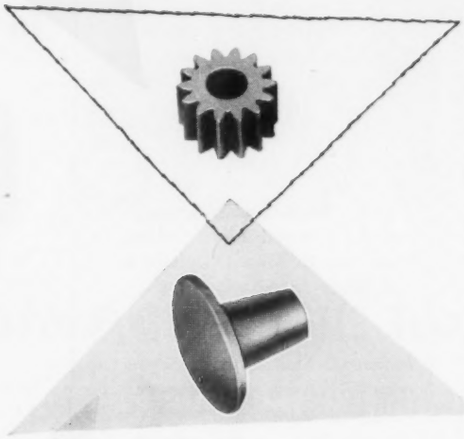
Offices in Principal Industrial Cities

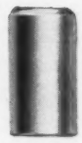
our knowledge began several billion parts ago!



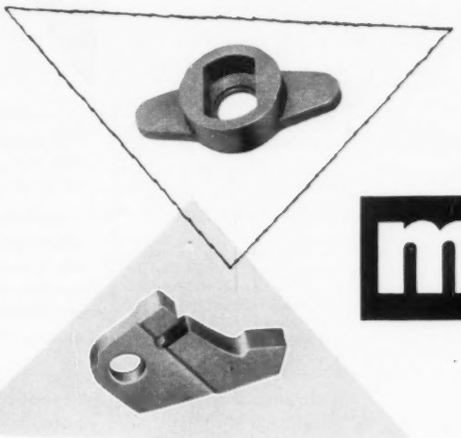
Thirty-two years and several billion parts ago we began learning about powder metallurgy. Our knowledge of this business is now considerable, yet even today there's no end in sight to what can still be learned.

Applying our always-growing knowledge enables us to find new ways to improve the physical properties of our metal powder products; to offer an ever-broadening range of materials to our customers; to make possible more and more applications.

Our position in the field of powder metallurgy is a proud one . . . but we take a greater pride in the fact that our products are providing industry with a means of improving performance while cutting costs.

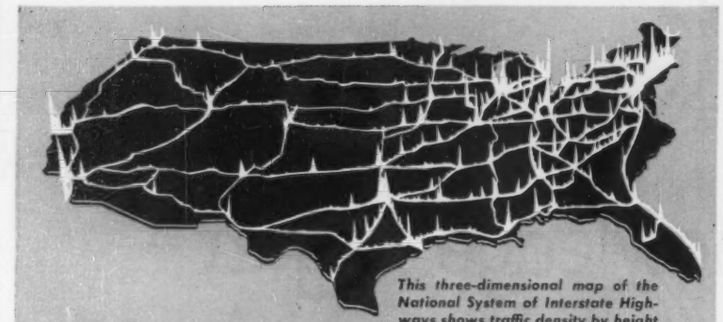


METAL POWDER PARTS BY MORAINE



moraine products

DIVISION OF GENERAL MOTORS CORPORATION, DAYTON, OHIO



This three-dimensional map of the National System of Interstate Highways shows traffic density by height of road.

Source: Public Roads Administration

GarWood

VIEWS THE AMERICAN ROAD

THIS

GAR WOOD

EQUIPMENT

BUILDS

BETTER

ROADS

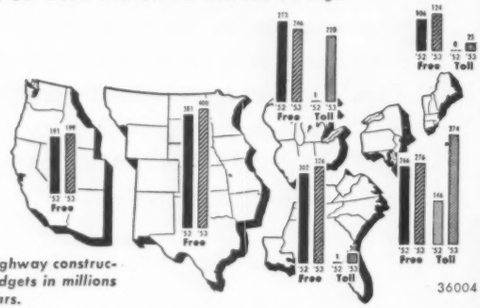
another big* GAR WOOD *market

Americans move 1,000,000 miles a minute over their highways. We have 60-million licensed drivers handling 55-million registered vehicles—more than was forecast for 1960. More than half our workers drive to their jobs . . . and their products go to market in 9-million trucks. A hundred thousand buses carry 6,000,000 children to school and home again while postmen travel 1½-million miles of rural routes to serve 60-million rural homes. Today, traffic volume moves 500,000,000,000—*or half a trillion*—vehicle miles annually—and that may well be doubled by 1970. Yet, of our 3,300,000 miles of public roadways, *two-thirds is dangerous and unsafe.*

86 per cent of all traffic moves over the 664,000 miles of our federal-aid highway system. This highway network is America's main artery of commerce—any sickness in this system affects the very life-blood of American business. *Yet 424,000 miles of this system needs major overhauling right this minute.*

The inter-state system of 37,800 miles (shown in the map above) represents little more than one per cent of the nation's total but carries more than 100 billion vehicle miles of traffic. Yet, of its 31,831 rural miles *only 1,900 are considered adequate.* Of 5,969 urban miles *only 398 are adequate.* Of 10,000 bridges, *19 out of 20 are substandard.* A cold, factual study of America's defense highway needs reveals damning shortcomings.

The Automobile Safety Foundation puts the cost of modernizing our highway system at a staggering $85,500,000,000 . . . $5,700,000,000 a year for 15 years. But the investment will be returned in business expansion and a stronger America for facts show that *good roads make good business.* Today we're faced with the mightiest construction challenge in history. Men, money and machines—including road-building equipment built by Gar Wood—must and will meet this challenge.



1953 highway construction budgets in millions of dollars.

36004

GAR WOOD INDUSTRIES, INC.

GENERAL OFFICES • WAYNE, MICHIGAN

GAR WOOD GW INDUSTRIES

WAYNE DIVISION, Wayne, Michigan; ST. PAUL HYDRAULIC HOIST DIVISION, Minneapolis, Minn.; FINDLAY DIVISION, Findlay, Ohio; RICHMOND DIVISION, Richmond, California; NATIONAL LIFT CO., Ypsilanti, Michigan; UNITED STOVE CO., Ypsilanti, Michigan

The Trend of BUSINESS

continued

fered the largest toll since early 1941. Casualties among lumber and building materials dealers mounted to the highest level since April, 1949. Failures were about as numerous as in the preceding month in all manufacturing industries. The only marked change in wholesale trade was an increase among food distributors.

The rate of increase in failures from a year ago varied considerably by industry and trade. In manufacturing and wholesaling, the rise amounted to 13 and 10 per cent respectively, as compared with 23 per cent in retailing and a rise of 27 per cent in construction.

Six of the nine major geographic regions reported more failures in June than in May. Only two areas had fewer casualties.

Many of the figures in Modern Industry's Statiscope appear in the monthly Trend of Business and the quarterly Compass Points (pages 21-26). More detailed monthly figures are available in DUN'S STATISTICAL REVIEW.

THE FAILURE RECORD

	June 1953	May 1953	June 1952	P.C. Chge.†
DUN'S FAILURE INDEX*				
Unadjusted	35.4	31.5	30.7	+15
Adjusted seasonally	35.8	30.0	31.0	+15
NUMBER OF FAILURES	817	697	671	+22
NUMBER BY SIZE OF DEBT				
Under $5,000	139	129	127	+ 9
$5,000–$25,000	395	323	344	+15
$25,000–$100,000	233	184	157	+48
$100,000 and over	50	61	43	+16
NUMBER BY INDUSTRY GROUPS				
Manufacturing	145	143	128	+13
Wholesale Trade	80	74	73	+10
Retail Trade	419	344	340	+23
Construction	99	70	78	+27
Commercial Serv.	74	66	52	+42
	(*LIABILITIES in thousands*)			
CURRENT	$32,379	$32,789	$21,222	+53
TOTAL	32,454	33,032	21,537	+51

*Apparent annual failures per 10,000 listed enterprises, formerly called DUN'S INSOLVENCY INDEX.
†Per cent change, June 1953 from June 1952.

BUSINESS FAILURES *include those businesses that ceased operations following assignment or bankruptcy; ceased with loss to creditors after such actions as execution, foreclosure, or attachment; voluntarily withdrew leaving unpaid obligations; were involved in court actions such as receivership, reorganization, or arrangement; or voluntarily compromised with creditors out of court.*

CURRENT LIABILITIES, *as used in the Failure Record, have a special meaning; they include all accounts and notes payable and all obligations, whether in secured form or not, known to be held by banks, officers, affiliated companies, supplying companies, or the Government. They do not include long-term, publicly held obligations. Offsetting assets are not taken into account.*

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10-KEY keyboard calculator—add, subtract, multiply, divide by effortless, high-speed touch figuring method. Electric and hand-operated models.

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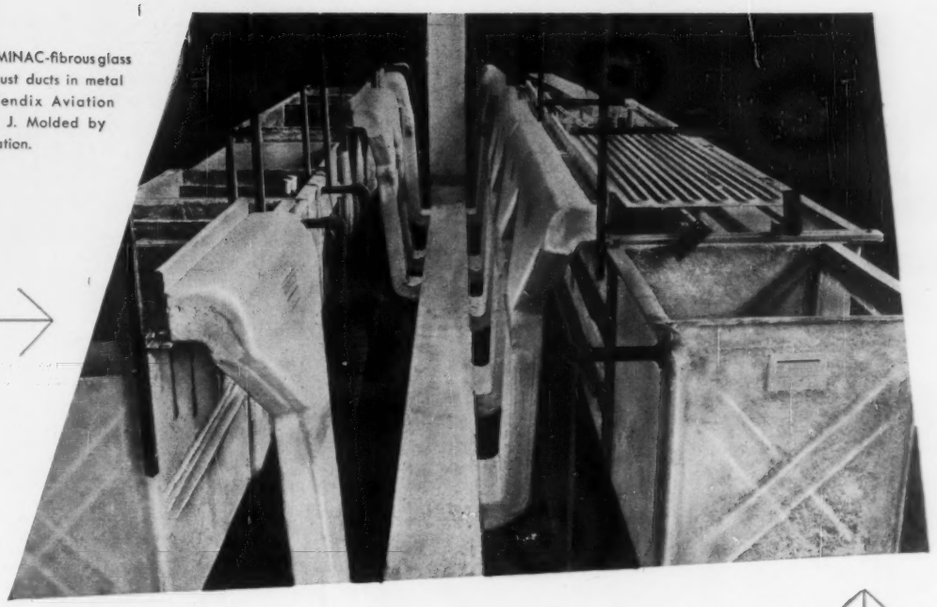
RUSTPROOF, DUSTPROOF, FOOLPROOF business machines—made of enduring Swedish steel. Finest service—factory trained—in 125 cities from coast-to-coast—backed by 10-year supply of spare parts.

For complete details, see your local dealer or write Dept. J, FACIT, Inc. 500 Fifth Ave., New York 36, N. Y.

SOLD & SERVICED THROUGHOUT THE WORLD

Corrosion-resistant LAMINAC-fibrous glass tanks and fume exhaust ducts in metal finishing room at Bendix Aviation Corp., Eatontown, N. J. Molded by The Chemical Corporation.



LAMINAC® Resin 4119 Takes Corrosive Baths . . .

. . . cuts installation and maintenance costs in electroplating and metal finishing plants!

Needed: By The Chemical Corporation, Springfield, Mass.—a light, strong, corrosion-resistant material for: electroplating tanks and barrels . . . hoods for tank exhausts . . . ducts and stacks for venting corrosive fumes.

Chosen: LAMINAC polyester resin 4119, reinforced with fibrous glass, for its outstanding chemical resistance, dielectric properties, heat resistance, dimensional stability, high strength-weight ratio, easy molding in large shapes.

Success: The new LAMINAC units resist temperatures up to 250° F, depending upon the solutions involved. And when tested at high voltages employed in electroplating the tanks have proved very satisfactory. No high-cost outside maintenance of tank shells . . . material is the same all the way through, cannot be harmed by spillage or rundown. Units weigh only a fraction as much as heavy, lined steel tanks and, in most cases, need no rigging.

REMEMBER . . . Only in the large family of LAMINAC polyester resins will you find—in superior degree—the combination of curing and service qualities you need. If you have a corrosion problem, we will be glad to help you determine whether there is a LAMINAC resin that meets *all* your requirements.

LAMINAC® polyester resins . . .
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made under rigid controls to American Cyanamid's high standards of quality.

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CAST SHAPES without costly procedures

● Impressive short-cuts in product development or actual production are being achieved through the use of a fast-setting casting resin for . . .

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- **Masking fixtures**
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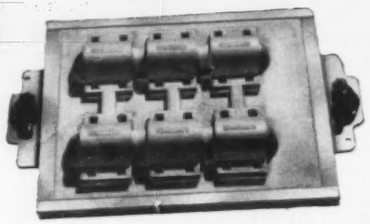
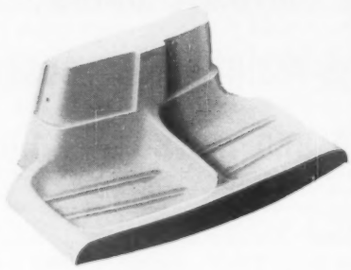
- **Foundry patterns**
- **Novelty castings**
- **Special electrical or corrosion-resistant parts**

This material is Durez 7421A, a liquid phenolic casting resin that hardens to full strength without pressure and with only a mild bake. It can be cast in plastics, rubber, resin, wood, or ceramics.

Parts cast by this economical method have good to excellent mechanical, electrical, and chemical properties. The resin molds readily to intricate shapes, can be machined and surface-finished easily, and can be colored before or after casting. For fast hardening with minimum shrinkage, we recommend our special accelerator.





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SPEAKING UP

Continued from page 38

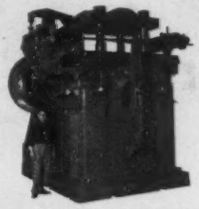
fact, an important executive attribute. But here again we betray the limitations of our vocabulary, for, while leadership is important, I am not at all sure that it is more than a small fraction of the answer. An articulate clergyman, for example, may be an able leader of ethical thought, or a soldier may exercise great leadership entirely through courage and personal example. Neither of them need necessarily have executive talent as we conceive it.

Judgment is important. Vision is probably essential. And we could exhaust our list of virtues without reaching the core of the problem. For I have known men with leadership, with judgment, with vision, who were not in any sense of the word good executives.

The best that I can offer is to say that the basic requirement of executive capacity is the ability to create a harmonious whole out of what the academic world calls dissimilar disciplines. This is a fancy way of saying that an executive is good when he can make a smoothly functioning team out of people with the many different skills required in the operation of a modern business. His most important function is to reconcile, to co-ordinate, to compromise, and to appraise the various viewpoints and talents under his direction to the end that each individual contributes his full measure to the business at hand.

But what are we going to do to assure that our bright young men —these executives of the future— will continue to come along as fast as we need them, and in sufficient quantity to shorten the odds on successful selection? For the more we have, the greater our chance of developing the leaders of to-morrow. And if this country is going to continue to be one of the strongest and most dynamic forces the world has ever seen, we are going to need those leaders badly. The question is, what incentives are we going to use to insure an adequate supply?

Before we find the answer we must take a hard look at experience to date. Some attribute our strong American economy to our natural resources; some to the inherent vigor of our people; some to our large land area. These factors are important, but they are certainly not



"NO SHUT-DOWNS WITH LUBRIPLATE"

—say HENRY & WRIGHT of Hartford, Conn.

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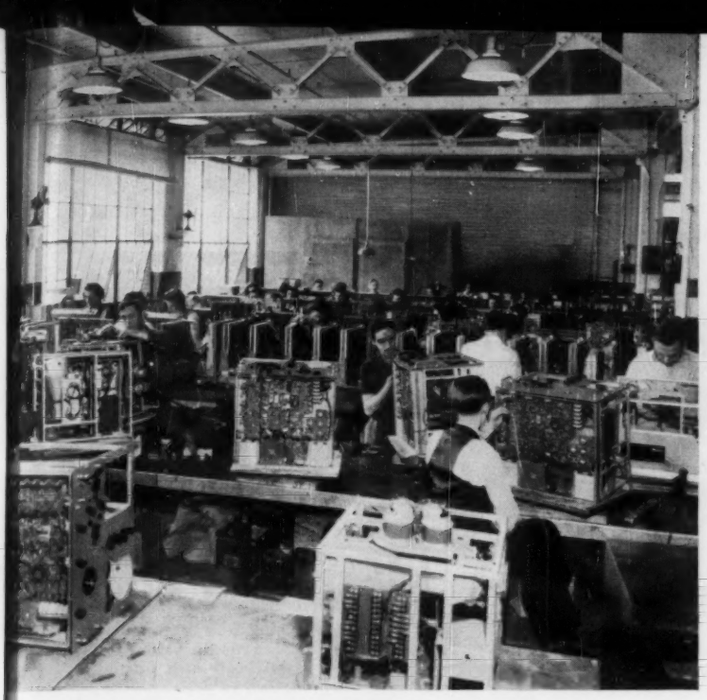
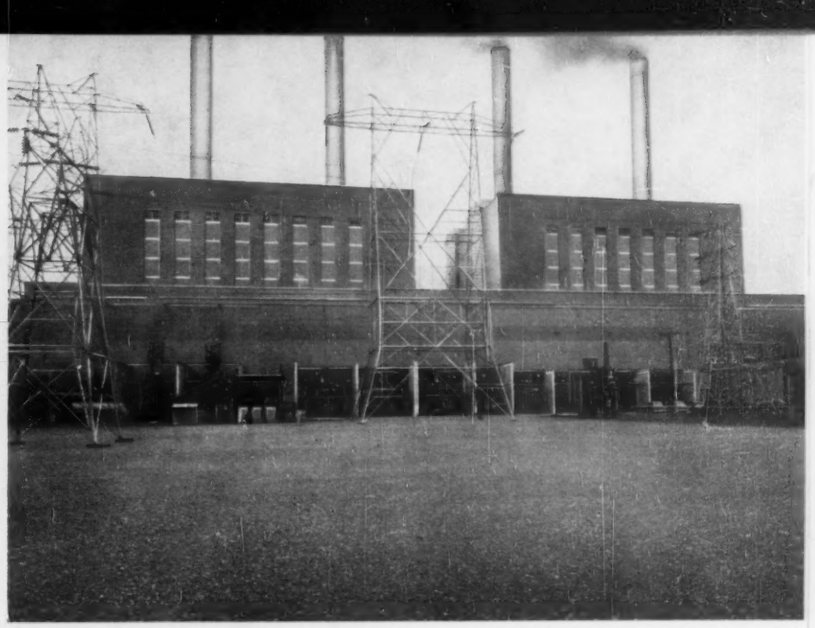
REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.



INDUSTRIAL RELATIONS plays an important role in today's business scene. A well-planned program of job evaluation can result in better employee relations and improved production. One job evaluation study Ebasco recently completed was for an Eastern electronics company.



DESIGN AND CONSTRUCTION services are in constant demand by electric companies which provide dependable electric service throughout America. Ebasco handled the design and construction of the new 375,000 kilowatt Sunbury Steam Electric Station, shown above, for Pennsylvania Power & Light Company.

HOW SPECIALIZED SERVICES GO TO WORK FOR BUSINESS AND INDUSTRY

Ebasco engineers, constructors, and business consultants are right at home in this age of specialization. They render services to companies in many different fields . . . devote their talents to assisting these companies when special problems arise.

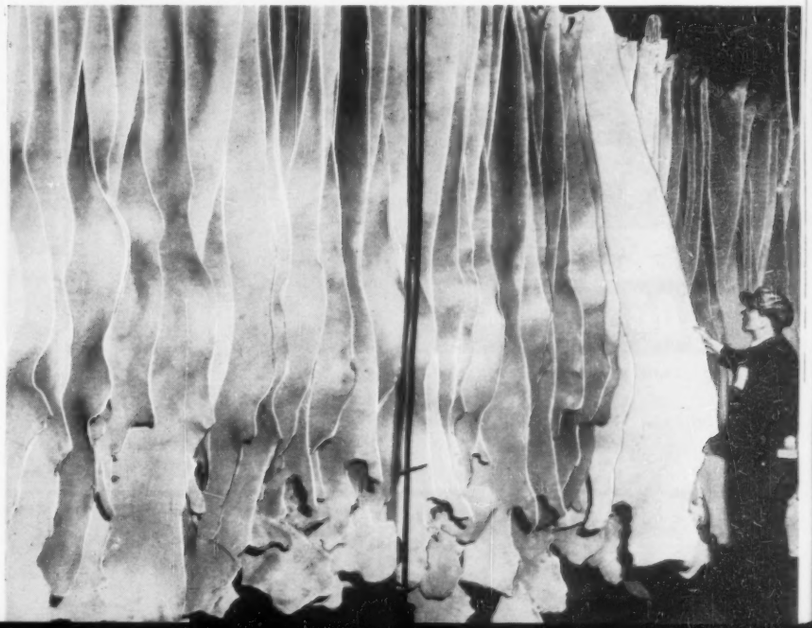
Throughout the United States and in many countries Ebasco undertakes diversified projects like those presented on this page for companies of all sizes, for long-established firms and new businesses.

It is very possible that Ebasco may be able to serve *you*. Our booklet, "The Inside Story of Outside Help," describes the full range of services we offer business and industry. May we send you a copy? Just write or phone Ebasco Services Incorporated, Dept. N, Two Rector Street, New York 6, N. Y.

PENSION and retirement plans help attract new employees to a company and hold present ones. That's why more and more firms are installing them. Ebasco has prepared pension programs for many prominent companies in many different fields.

MARKET STUDIES are used by business and industry to provide a blueprint for sales and marketing programs. One such study made by Ebasco was of the effervescent teenage market—for one of the nation's largest manufacturers of soft drinks.

ENGINEERING SURVEYS often enable companies to reduce their production costs. Ebasco's engineering recommendations to a leather processing company, for example, resulted in abandonment of outgrown power facilities which were costly in manpower and space, and inefficient in the production of steam and electric power. This move produced annual savings many times greater than the cost of the survey.



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R & M saves money

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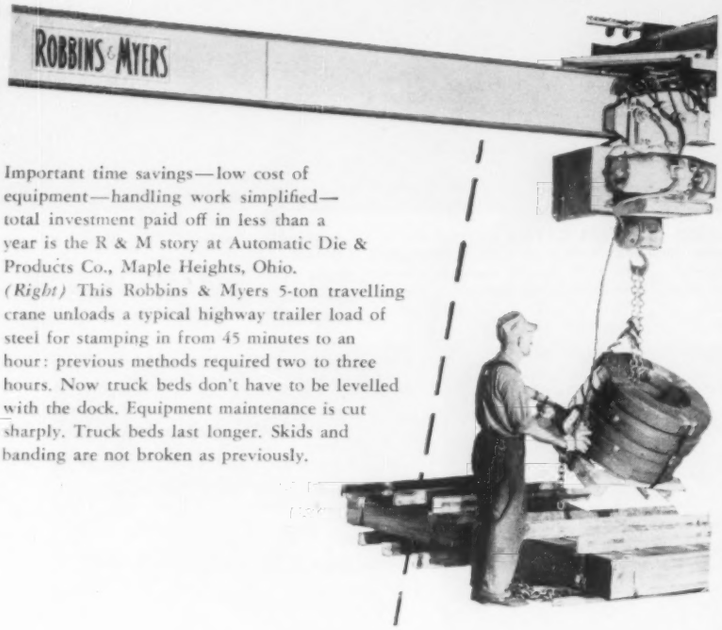

Important time savings—low cost of equipment—handling work simplified—total investment paid off in less than a year is the R & M story at Automatic Die & Products Co., Maple Heights, Ohio.
(Right) This Robbins & Myers 5-ton travelling crane unloads a typical highway trailer load of steel for stamping in from 45 minutes to an hour: previous methods required two to three hours. Now truck beds don't have to be levelled with the dock. Equipment maintenance is cut sharply. Truck beds last longer. Skids and banding are not broken as previously.

and going

for Automatic Die & Products Company

(Left) Moving scrap into railroad cars was a tough, dirty, three man job—hard on men and wheeled equipment. Now two men plus an R & M "J" hoist on a Trambeam with jib move and dump a car of scrap in less than half the time. Demurrage on cars is greatly reduced. R & M representatives have many cost and time saving case histories one of which may solve your handling problems. Write for Bulletin No. M82I.

TAKE IT UP WITH

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the whole story, for if they were, many other nations would be our equal and some would perhaps have shown even greater progress.

Reasons For Greatness

I have no doubt at all that this nation's greatness is due simply to this fact: Under our principle of individual liberty, human incentive has been given its widest possible scope. To each of us has been given the opportunity to do his best; to each the right to retain the fruits of his labors; to each the responsibility of preserving those rights for his neighbor.

Human incentives are simple, and relatively few in number. Most of us derive personal satisfaction from a knowledge that we have done our best, and some would consider this inner satisfaction an adequate reward. Some strive for the prestige success will bring, for the admiration and respect of their fellow men. Some work for power and the influence so obtained over the lives and activities of others. But for most of us, the strongest and most desirable incentive of all is financial gain—not, of course, in money itself, but because of what one can do with it.

One man may want a yacht, another may want to endow a hospital, a third may want security for his children. What is important is that he do his best, for only then can the nation reap the greatest benefits from his abilities.

We should also recognize the importance of financial rewards in

The AUTHOR

Crawford H. Greenewalt joined E. I. du Pont de Nemours and Company upon his graduation from Massachusetts Institute of Technology in 1922. Starting out as a control chemist, he was later transferred to the Experimental Station where he was active in the development of nylon.

Elected a company director in 1942, he was transferred from chemical research to the explosives department for the war years. His was the responsibility of translating the nuclear research developments of the University of Chicago into practical application at the Hanford works.

Mr. Greenewalt was elected to the presidency in 1948 and is the holder of many honorary degrees and a member of several science, chemical, and business institutes, among them, the National Academy of Sciences, the MIT Corporation, the American Institute of Chemical Engineers, and the Business Advisory Council of the United States Department of Commerce.

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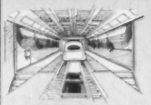

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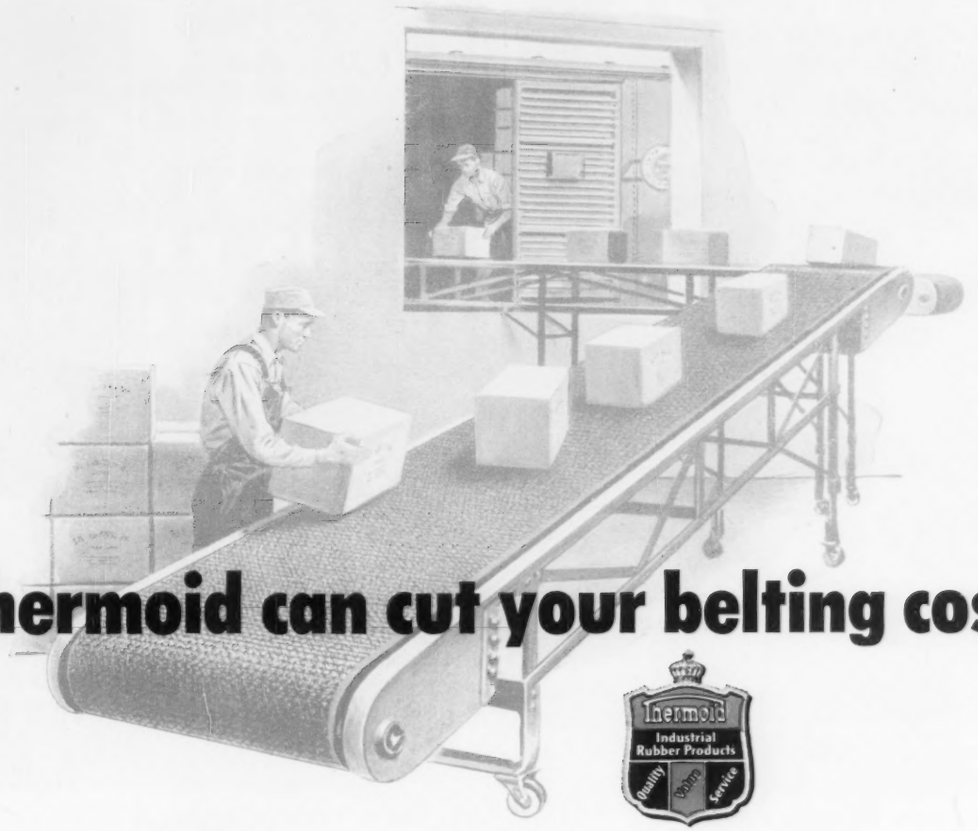

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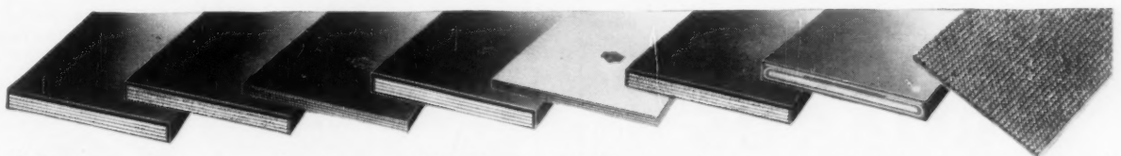

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balancing other types of incentive, and so insuring able candidates for every field of endeavor. Personal prestige, for example, is more likely to accompany success in the sciences, in universities, or in the professions than it is in business. Were we not able to offset this by increased financial reward, I suspect that business would have much greater difficulty filling its ranks with able people.

Future Losses

Industry must compete for a share of the able and the talented—the old familiar problem of supply and demand. If financial rewards decline in attractiveness, we will see many of our ablest people selecting those fields that offer incentives of a different kind. The loss to industry will be serious, and industry's capacity to serve the nation will be reduced accordingly.

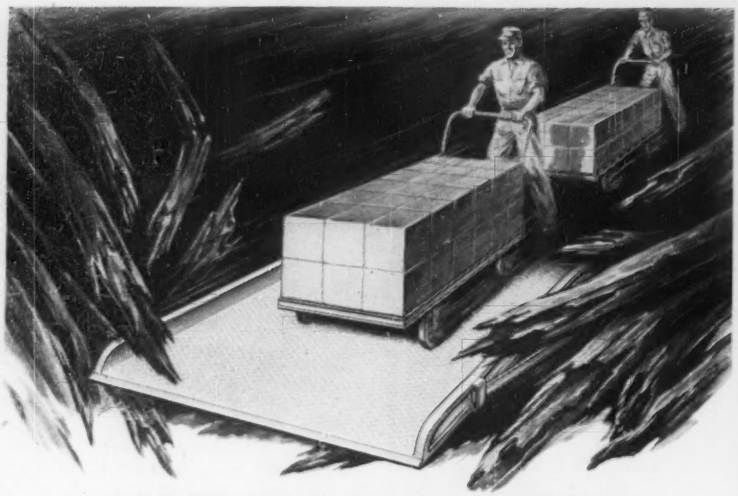
Much has been said about the vulgarity of the money motive, but I doubt if one could find a cleaner or more honest basis for rewarding superior performance. A desire for power is surely less worthy, and I cannot believe that efforts simply to win the admiration of the crowd are ethically more desirable.

And so it is distressing to see financial incentives weakened in these days of high personal income taxes—and I think, to be realistic, we must assume the chances of substantial improvement in the picture

MONKMEYER PHOTOGRAPH

are remote. Many seem to incline to the wry view that taxes are here to stay. If financial incentive is the strongest of the incentives we have to offer, it must of necessity follow that the nation's vigor will be weakened by its removal. And it is for the nation, not the individual, that we should be primarily concerned.

Two points seem to me plain. If the financial incentive is absent or greatly reduced, the number of candidates for top management positions will decrease, since many men



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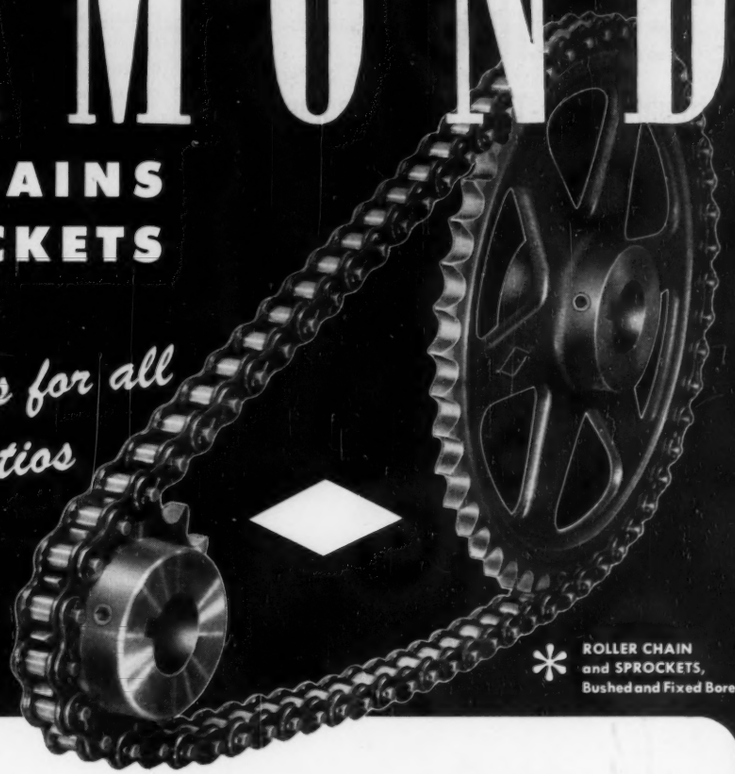
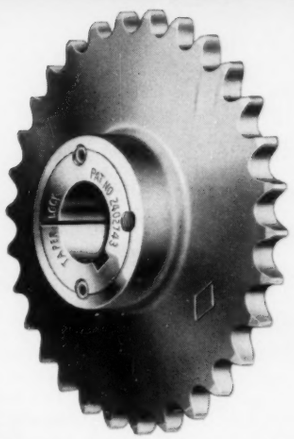
ROLLER CHAINS AND SPROCKETS

A balanced stock meets requirements for all standard drive ratios and popular H. P. capacities*

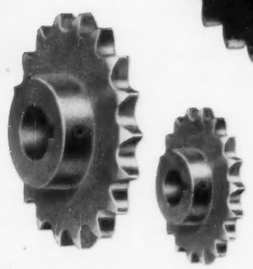


* ROLLER CHAIN and SPROCKETS, Bushed and Fixed Bore



BUSHED SPROCKETS

With the Taper Bore Sprocket and Bushing, the bushing is changed to meet various bore sizes.



FIXED BORE SPROCKETS

Small size Diamond finished fixed bore stock sprockets (with keyways and setscrews) give the distributor the balanced stock to meet the widest possible chain drive requirements.

STOCK SPROCKETS FOR ALL POPULAR SHAFT SIZES

(Taper Lock and Fixed Bore Types)

The Diamond Chain combination of roller chains, taper bore sprockets and bushings, and the fixed bore sprockets in the small sizes provide for emergency and normal service demands for all standard drive ratios and popular horsepower capacities.

Take advantage of the "over-the-counter" availability of this Diamond stock of Chains and Sprockets for new applications and replacements. This stock is as near as your telephone. See the yellow pages of your classified telephone directory for the address of the Diamond Chain distributor.

DIAMOND CHAIN COMPANY, Inc.

Where High Quality is Traditional

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Offices and Distributors in All Principal Cities

The New Frigidaire "Executive"

A Sensational Bottle-Type Water Cooler with Handy Refrigerated Compartment

Here's the perfect answer to your office drinking water problem. This new Frigidaire Cooler puts ice cold, refreshing water right at your finger tips for you and your callers to enjoy.

Easy action push-button faucet shuts off automatically when released. Handy refrigerated compartment, with built-in lock, hides a generous supply of ice cubes and room for cooling bottles, food, and other items. Beautifully styled, beautifully designed. Requires no plumbing, plugs into any 115-v. AC outlet. Powered by famous Frigidaire Meter-Miser warranted for 5 years—whisper quiet, trouble-free. Available either with or without compartment shown. Frigidaire also offers a complete line of Pressure Type Water Coolers with outstanding convenience and economy features.

Find your Frigidaire Dealer in the Yellow Pages of phone book. Or write Frigidaire, Dayton 1, Ohio. In Canada, Toronto 13, Ontario.

Frigidaire Water Coolers

BUILT AND BACKED BY GENERAL MOTORS

The most complete line of air conditioning and refrigeration products in the industry

who would otherwise have entered the competitive race will have gone into vocations where the rewards seem to them more desirable. And, as we have seen, the motives that remain seem less likely to produce the best in management for our business enterprises. Certainly the desire for power, or admiration, are not characteristics that would be expected to lead to the kind of competence we need in management.

Foreign Examples

Many substitutes for financial incentive have been tried in other countries. In England there are titles; elsewhere much is made of social distinction or of personal prerogative (notably Russia, where the worker's living space, for example, is allotted according to his job output). Some of these are relatively harmless; others are to us merely distasteful; none of them is in harmony with our democratic society.

Business, for the most part, has little to offer in the way of comparable intangibles. With the exception of a few glamor jobs, even top executives of vast ability remain relatively unknown outside their own field. By its very nature, business is largely anonymous—it is a team effort with few featured performers. A bit-player on television, a dance-band leader or a third-drawer novelist is far better known than many leaders of industry. This is not to derogate those who meet popular fancy; it is simply a fact of the corporate life. Business people work hard and have little time for outside activities. There are no medals, decorations, stripes, uniforms, or grandiose titles. The strongest inducement business can provide is financial reward.

Now if not money, what? Many

"Early lunch to-day, Smith?

They keep coming back for more

In 1952, over 60% of Trundle's business came from clients previously served. Since its founding in 1919, the Trundle organization has averaged over six jobs per client.

• • •

As a measure of performance, we submit this record as being outstanding in the management consulting field. Should your firm recognize a need for factual, unbiased analysis and assistance in any of the areas listed below, we will welcome an opportunity to discuss your problems—without obligation on your part.

A Helpful Guidepost to the selection of a consulting service is provided in our booklet, *Consulting Service for Management*. We'll gladly send a copy to interested business executives. Write to The Trundle Engineering Co., Room 103, Trundle Building, 2020 Carnegie Ave., Cleveland, O.

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Photostat Instant Copier

for use in any office... everywhere!

Here is a small, inexpensive machine which will make three or more black-on-white copies of practically any original up to 8½" x 14" in size in *one minute*, ready for immediate use!

It takes up less than two square feet of space on desk or table... it can be used under any normal office lighting at any time by anyone in the office.

The PHOTOSTAT INSTANT COPIER is designed to get the very best results from the new EASTMAN KODAK COMPANY'S VERIFAX process... a truly revolutionary method of making copies of anything typed, printed, written or drawn. It is entirely different from, and should not be confused with, any previously known process. No other office copying equipment can equal the versatility and flexibility obtainable with the combination of the new PHOTOSTAT INSTANT COPIER and the VERIFAX process. And it is fully guaranteed by Photostat Corporation!

*For over forty years, PHOTOSTAT CORPORATION has led the way in the manufacture and marketing of photographic copying apparatus for every type of business use . . . every Federal, State, County and Municipal government need.

The new PHOTOSTAT INSTANT COPIER will be sold and serviced by our field staff from coast to coast and in Canada in the same efficient manner and under the same conditions as now apply to our larger and long established models of photographic copying apparatus.

You will be amply repaid if you get full details before purchasing *any* office photo-copying equipment. Write to

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305 STATE STREET, ROCHESTER 14, NEW YORK

— or any service office in our principal cities and in Canada

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companies have explored the possibilities of non-monetary incentives as executive reward. Some of these seem to be simply compensation in disguise and may encounter adverse tax interpretations later on. Others, such as longer vacations, are transplanted from other fields and may or may not prove adaptable to the business climate. The nice thing about money is that it has such a wide circle of admirers. People spend it in different ways but its appeal is generally the same.

Seek Elsewhere

I don't think the same will apply to non-monetary rewards, for human nature is often perverse and what fascinates Peter may bore Paul. So while I hope for the best in these interesting experiments, in the long run I am afraid we must look elsewhere. I believe that the only solution, if there is a solution, will appear *through enhancing the prestige of an executive career.*

This is not a feat to be accomplished by superficial and artificial means. It cannot be achieved by bestowing synthetic honors or by making pious speeches.

No, prestige comparable to the prestige attached to older and more traditional professions can really come only from within. What the world thinks about us is usually a

NOY PHOTOGRAPH

reflection, in some degree, of what we think about ourselves.

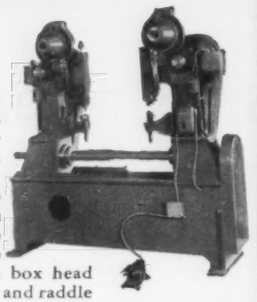
Could it be that behind the confident exterior of the business executive is the apologetic question mark? Do we in the business world secretly or even subconsciously feel that, after all, teaching or medicine or pure science is of greater worth or nobility?

If so, it is high time that business sheds its inferiority complex and takes its rightful place in the ranks of other honored professions. The older and more established callings have done much for the improve-

Speed Production.. Automatically with **T-J**

RIVITORS

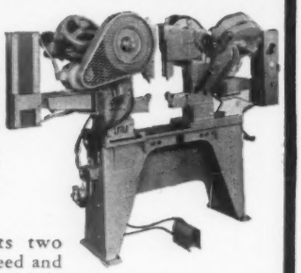
T-J RIVITOR used for automotive clutch plate assembly. Saves time and labor doing a four-fold job—assembling, setting, inspecting and ejecting.



DOUBLE RIVITOR sets two rivets at a time! Equipped with 10" hoppers, and tooled to automatically feed and set two ¼" diam. x ⅝" long wagon box head rivets at a time in elevator chain and raddle or elevator flight assemblies for farm implements. Controlled by one foot pedal.

CLINCHORS

T-J CLINCHOR.. one of six special 8" throat Underfeed Clinchors used by a large automotive body manufacturer. Feeds and sets 11/16" square cased nuts in outside quarter panels, left and right hand.



DOUBLE CLINCHOR sets two nuts at once! Tooled to feed and set ⅜" x ½" x 1/16" thick Fabri-Steel nuts at each operation. Both Clinchors tripped by same foot-operated valve. Adaptable to wide range of clinch nut setting problems.

Boost production . . . save labor with T-J Rivitors and Clinchors for many assembly jobs today . . . in aircraft, automotive, farm machinery, stampings of all kinds.

T-J CLINCHORS set clinch nuts 3 to 5 times faster! Fully automatic . . . controlled by a single foot pedal! Available in Underfeed and Gravity feed models, throat depths 8" to 36".

T-J RIVITORS automatically feed and set solid rivets . . . with high production! Electrically-powered Rivitor sets 1/16" to ¼" diam. solid steel rivets up to ⅞" long. Air-powered Rivitor sets aluminum alloy rivets up to ¼" diam. or steel rivets up to ⅛" diam. and up to ¾" long. Throat depths 8" to 36".

Write for Clinchor bulletin 847; Rivitor bulletins 646 and 847. The Tomkins-Johnson Co., Jackson, Mich.

37 YEARS EXPERIENCE T-J

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EVEN EASIER, FASTER, SAFER 750 TO 1000-LB. LOAD LIFTING WITH . . .

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Strong fabricated construction.
Quickly adjustable forks.
Straddle-type base.
Rear Swivel casters.
Hand operated safety brakes.
Pedal or battery operated.
OTHER NEW FEATURES

With optional remote control operator can use lift as portable elevator.

BATTERY OPERATED
Capacity 1000 lbs.
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Push-button control.
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Priced from $672.50
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Capacity 750 lbs.
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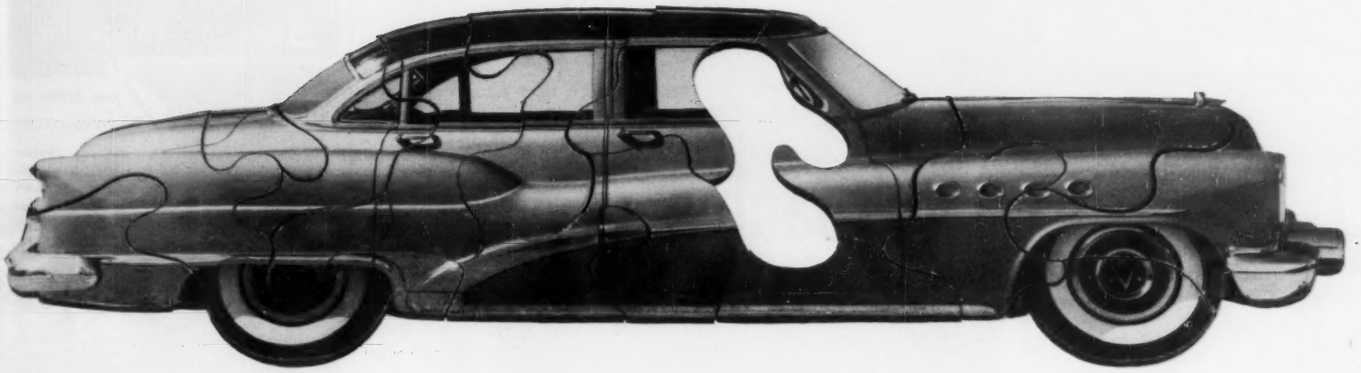

When you buy a car, you don't assemble the parts!

And when you contract for a new industrial plant, you should follow a similar line of reasoning. Your car bears the name of one manufacturer—one company that's prepared to guarantee every component. Your car's trade-mark is your assurance of undivided responsibility.

The same is true when you award a contract to *one* reputable engineering-building company to provide you with additional or new plant facilities.

Here are some of the specific advantages:

1. **You'll save money**
   —an engineering-construction team which works as a unit year-after-year achieves a degree of coordination not available when several different firms are involved in a single project on a one-shot basis
   —engineers in constant contact with actual construction practices are in a position to design for maximum field economy
   —engaging one firm to handle the entire job means that you pay only *one* fee, only *one* overhead
2. **You'll save time**
   —your job can actually be under construction just a few weeks after a contract is signed—early production and a quick return on invested capital are assured
   —while the job is in progress, you eliminate costly delays that may result when several engineering and construction firms are involved
3. **You'll save effort**
   —you'll be dealing with one firm, not several, and you'll save yourself hours of repetitive orientation and explanation

And last, but perhaps most important:

4. **You'll have a guarantee that means something**
   —if trouble does arise, there's only one company that's responsible—you know where to go to insist on an efficiently operating plant

WALTER KIDDE CONSTRUCTORS, INC. has engineered and constructed industrial plant facilities on a turnkey basis in a diversified range of industry. KIDDE's comprehensive engineering-construction organization, utilized on your next plant expansion, can save you money, time and effort—and guarantee you that you'll get the kind of plant you specify.

Remember: when you buy a car, you don't assemble the parts. We suggest that you consider the same approach in buying your next industrial plant.

Walter Kidde Constructors, Inc.

Engineers and builders

140 Cedar Street, New York 6 • Southwest office: 1205 Holman Avenue, Houston 4, Texas

Industrial plants, chemical plants, manufacturing buildings, research laboratories, power plants and other industrial facilities

Our engineers will gladly discuss with you your plans for plant expansion. A telephone call or a letter will not obligate you in any way whatsoever.

a fresh approach to your favorite idea

It could be that a fresh, positive approach will lift **your** idea into the realm of reality—will put it profitably to work for you . . . just as it did for Stedman Packing.

Example of conical type Stedman Packing. Disks are welded back-to-back and edge-to-edge.

The Stedman Packing Problem: The developers of Stedman Packing had a product which proved wonderfully successful in laboratory and pilot plant—but could only be hand produced, slowly and at prohibitive expense.

The Oiljak Solution: Working closely with the developers, Oiljak ingenuity developed a welding machine that replaced 117 separate hand operations. Stedman Packing progressed from a good idea to a commercial reality.

And this is the reason for the existence of The Oiljak Manufacturing Company. We are Contract Manufacturers—with full design, manufacturing, packaging and shipping departments. By doing business with Oiljak you are adding to your own plant facilities—with no capital investment . . . and are getting the benefits of a basically optimistic approach to even your toughest problems.

If your idea is worth having it's worth giving us a call, or sending us a letter. You may be sure that you will receive a cordial reply and that your idea will get the best of treatment.

THE **Oiljak**

MANUFACTURING COMPANY, INC.

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CONTRACT MANUFACTURERS TO FAMOUS TRADE MARKS

ment of mankind, and continue to do so. There is no disparagement in the reflection that none has ever accomplished as much in as short a time.

I like to think that business as a profession has come of age, and its members can now stand before the world as practitioners of a difficult and complex art, without which the world would be the poorer.

Prestige for this new profession will come, I know. It will come as people begin to understand and appreciate the contribution of business to the social, cultural, and spiritual advancement of our country.

The executive must take real pride in his accomplishments. He must share that pride with his associates, his family. He has every reason to be proud. If he is to enlarge the scope of his profession and insure its future, he must communicate that pride to all the world.

THE END

PROMINENT MEN QUIZ ANSWERS

PROFESSIONS

Marlon Brando	Actor
Norman Rockwell	Artist
Frederick Vinson	Chief Justice, US Supreme Court
Hoyt Vandenburg	General
William Faulkner	Novelist
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Perry Como	Singer
James Doolittle	General
Robert Hutchins	Educator
Walter Hagen	Golfer

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Benjamin Fairless	US Steel
James J. Nance	Packard Motors
Keith Funston	New York Stock Exchange
Eugene Holman	Standard Oil (New Jersey)
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"You're Quite Welcome, Barton. Now Send Hoskins in."

ROURA Self-Dumping **HOPPERS**

—they pay for themselves

$AVE 50% LABOR-TIME

• SIMPLE
• SAFE
• SPEEDY

Fitting any standard fork or platform lift truck, thousands of ROURA HOPPERS are in constant operation handling wet or dry, hot or cold, bulky materials. Simple to operate—only one man is required for distributing and unloading—quicker and easier.

The ROURA HOPPER dumps, rights and locks itself securely by a simple lift of the patented release handle. Sizes ½ to 2 cu. yds. ROURAS can also be designed for flat trucks and in other sizes to meet specifications—can be equipped with special flanges to permit stacking for storage or future distribution. The ROURA will quickly pay for itself many times over.

Write today for detailed brochure.

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PRECISION MADE FOR

Quality Products

The consistent quality standard of Runzel wire, cord and cable offers manufacturers complete assurance of performance. Runzel products undergo such thorough inspections in the process of their manufacture that flaws are reduced to an absolute minimum.

Your wire needs in hook-up, lead-in, shielded wire speaker cords and all types of insulated wire are available from this centrally located source. We maintain a complete engineering service. Your wiring problems are solicited. For their scientific solution, the Runzel Laboratory provides research assistance.

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MATERIALS & DESIGN

New materials for consumer products, electrical equipment, packaging, and plant construction, plus new design ideas are featured here.

Get a fresh approach with wood and paper

New treatments for, and new combinations of, wood fibers, paper, and plywood are bringing better and lower-cost materials for plant construction, packaging, and products ranging from luggage to duck decoys.

Last month, for instance, American Cyanamid Company and a score of papermakers got together to show what can be done with melamine resin treatments to increase both wet and dry strength of paper, produce water-barrier materials, and lint-free sheets. Such treatments pave the way for good-looking, durable paper luggage, disposable paper raincoats and bathing suits, better wiping tissues, and molded paper duck decoys that float on water like the real thing.

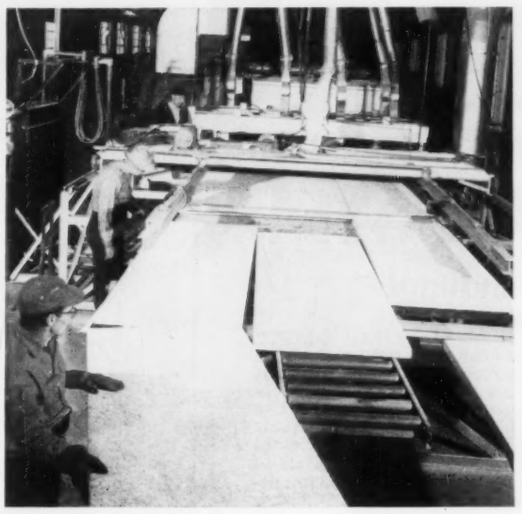
In addition to new and improved "Melostrength" resins for this type of application, American Cyanamid has just introduced a synthetic sizing agent which can be used in alkaline as well as acid stocks, and, says the company, "makes it possible to manufacture papers previously considered impossible." Alkaline papers which can be produced with the new "Cyron" size should be especially useful the company says where acid corrosion has been a problem (labels for tin cans, for instance), and for such applications as wrapping soap and other alkaline materials which tend to deteriorate resin sizing.

But treatments like these are only one of several new angles on paper and its sister material, wood.

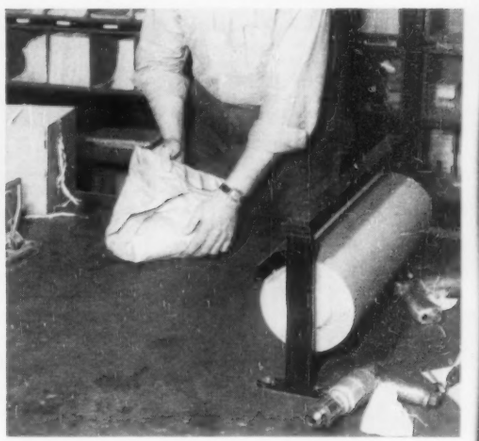
For instance, Tectum Corporation, Newark, Ohio, is bonding shredded wood fibers with an inorganic cement to produce a lightweight, strong, fire-resistant paneling material for roof decking and other industrial uses. Because the material can be made from waste wood—small chips and pieces—and lends itself to high-speed production, it's potentially low in cost. The roof decking pictured—as installed—is 35 to 45 cents a square foot. Acoustical ceilings are estimated to run at 60 to 75 cents.

In still another new material, plywood and paper are laminated together to combine the advantages of both. This material, "Ply-veneer," made by Weyerhaeuser Timber Company, Tacoma, Wash., has a plywood core and kraft paper

Plywood and paper join hands in new Weyerhaeuser paneling and box material. It's made in several thicknesses, takes printing well, can be fastened by standard means.



Shredded wood fibers, bonded with inorganic cement, form a new roof deck material, "Tectum," that's said to offer light weight, noise and heat insulation, fire resistance.

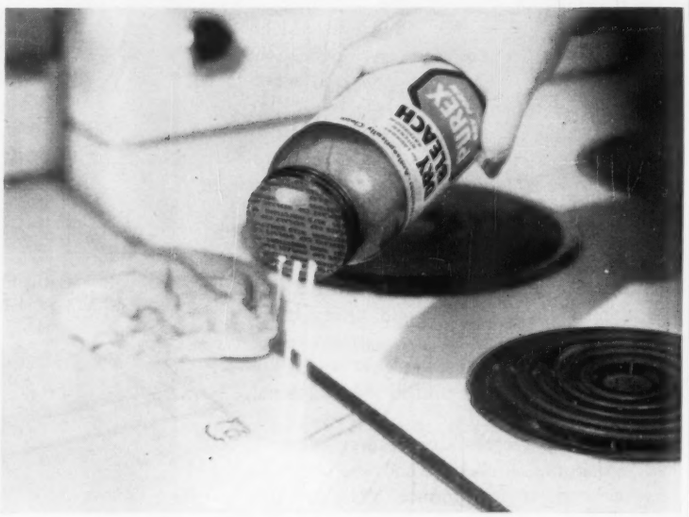


New wrapping paper, with special rubber-base self-seal coating, forms its own bond when coated surfaces are pressed together. Sherman Paper Products Corporation makes it.

continued

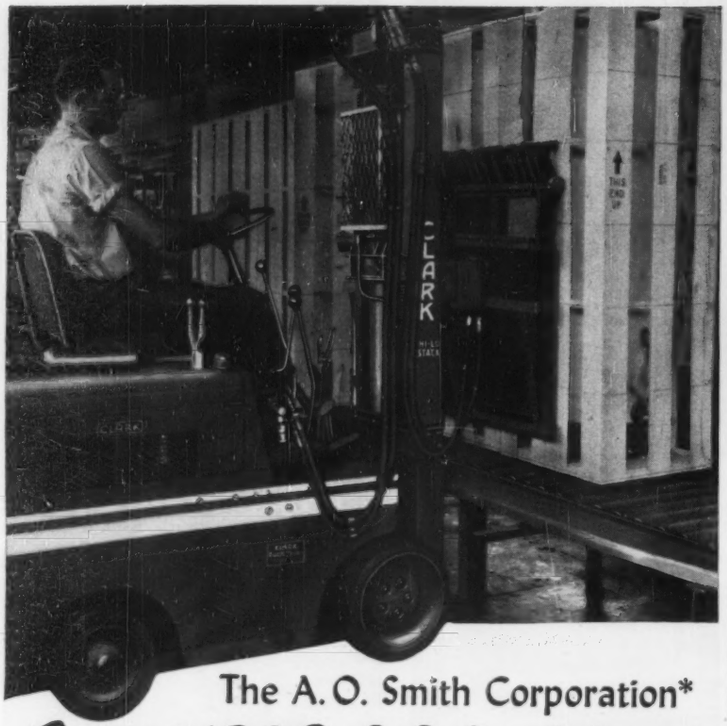
facing. It's designed to offer the printability of paper along with the rigidity of wood for paneling and packaging applications. Weyerhaeuser says panel stock will average about 3 cents a square foot, and containers should be intermediate in cost between corrugated cartons and wood boxes.

Still another new wood product is a lower-priced, plastic-faced plywood offered by Georgia-Pacific Plywood Company, Augusta, Ga., for both exterior and interior use. To make it, Georgia-Pacific combines cellulose fibers and phenolic resins before the overlay is formed, rather than by dipping cellulose



Helping a new product sell itself

Having built a better mousetrap—a chlorine bleach in dry, powder form instead of the usual liquid—Purex Corporation, Ltd., South Gate, Cal., is helping open the path to its door with smart packaging ideas that take advantage of the technical development. The dry bleach—with no water to ship and store—is easier to handle and takes up less space. Purex points up these sales advantages by suggesting, right on the carton (top picture), that the new dry bleach be displayed between larger liquid bleach bottles to point up the difference to retailer as well as consumer (166 bottles of dry bleach fit in the space taken by 66 of liquid). To make the product easy to use without sacrificing protective packaging, Purex perforates the covering membrane so the housewife can easily punch through the large and small pouring holes to remove the contents.



The A. O. Smith Corporation*

SAVES $108,000 a YEAR

in materials handling!

This is what the A. O. Smith Corporation accomplished:

1 Saved 43,300 man-hours or $78,000 a year in shipping and warehousing.

2 Minimized breakage and damage to crates, saved $30,240 a year on repair labor.

3 Eliminated 4000 double-faced pallets costing $16,000.

4 Accomplished a 30% reduction in required storage area—crates are exactly-positioned in neat rows, two, three and four high.

5 Cut boxcar loading time in half—one car is fully-loaded in one hour flat, by one man.

6 Eliminated hazardous difficult labor—all lifting is done mechanically.

WITH A SPECIAL "FINGER-LIFT" device for crate-handling, combined with a side-shifter attachment for their fork trucks, the A. O. Smith Corporation not only reduced labor costs $108,000 a year—they also eliminated $16,000 worth of pallets and made available 27 men and 3 trucks for other work!

As usual, CLARK plays a major role in this amazing savings achievement. Admittedly, not everyone can save $100,000 a year with modern handling equipment; but by the same token, you might save more, depending on the nature of your handling problem. Why not find out what's in it for you? Simply ask your CLARK Dealer to analyze your own particular handling activities. Don't pass up this opportunity for *really big savings!*

* Permaglas-Heating Division, Kankakee, Illinois
Detailed case history available on request.

1903 1953 FIRST FIFTY YEARS CLARK EQUIPMENT

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS
AND POWERED HAND TRUCKS • INDUSTRIAL TOWING TRACTORS

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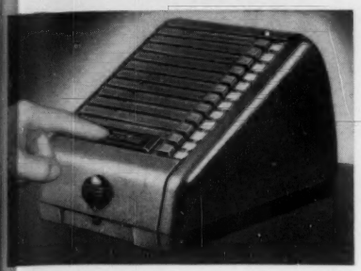
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

Don't Walk... TALK!



THE NEW EXECUTONE INTERCOM

Saves steps, increases output, cuts costs!

Compute the cost of time wasted by executives and employees running back and forth. *That's how much* the NEW Executone Intercom can save you! Your voice—with lightning speed—gets information, gives instructions. Your employees accomplish more, too, with inter-departmental communication. "Inside calls" no longer tie up telephone lines. Office and plant operate at a new peak of efficiency!

Years ahead of its time in operation and design!

"CHIME-MATIC" Signalling announces calls with a soft chime and signal light, saves time on every call. New switching circuits for every need make new savings possible. Voices are clearer, distinct, instantly recognizable. Inexpensive 2 station system easily expanded. *See* it—no obligation. Just mail the coupon.

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☐ Complete descriptive literature
NAME.....
FIRM.....
ADDRESS..... CITY.....

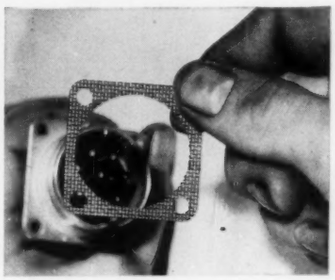
continued

sheets in a resin bath. The material is offered in green only, and is designed to be painted.

Last, but by no means least, and representing still another approach to new products and packages of paper is Sherman Paper Products' "Spot-Seal" (see photographs). The special rubber coating on this paper sticks to itself—but to nothing else—and permits fast, neat wrapping of odd-shaped parts and products. Packages are tamper-proof, too. They can't be opened without destroying the wrap.

Materials-in-brief

• A major development in porcelain enameling, long the subject of intensive study, seems at last to be reaching practicality. This is a method for field repair of vitreous coatings. Such coatings derive one of their greatest values from their hardness and heat resistance. But these qualities have also meant that porcelain enameling called for high-temperature furnaces, and field repairs were difficult if not impossible. Now, Seaporcel Metals, Inc., reports encouraging progress in flame-spraying of porcelain enamel and predicts the technique should soon be ready for military and commercial use. In the Seaporcel technique, a special acetylene torch ("gun") is used to preheat the base metal. Then, powdered enamel frit



Aluminum-neoprene shield

High electrical conductivity, dimensional stability, and resistance to deterioration are three advantages claimed for new gasketing material made of aluminum wire screening and du Pont neoprene. Used to mount electrical equipment in automobiles and aircraft, it should find many other electrical and electronic jobs, and chemical and mechanical applications as well. Vulcanized Rubber & Plastics Company, Morrisville, Pa., makes it.

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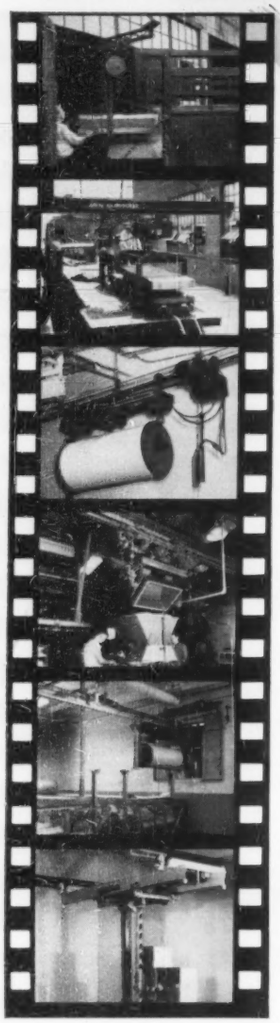

a 16 mm sound movie that discusses handling problems common to every industry

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Stacker crane increases storage by 60%

Before you decide upon any material handling equipment, let us loan you "Up and Over" This 16 mm film shows many installations of American MonoRail overhead handling equipment. You will see hand operated to fully automatic systems — one or more that may be particularly adaptable to your operations. The film is educational, interesting, informative and shows the way to economical, safe and time-saving material handling. Your ticket of admission is only a note to us asking for a print. It will help us if you advise the exact date, as close as possible, when you wish to see it.

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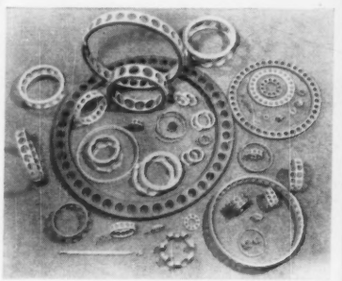
continued

is blown through tiny holes surrounding the torch nozzle. As it emerges, it is melted and propelled against the surface to be coated. The process isn't ready for general use yet—but it's on the way.

• Republic Steel Corporation's purchase last month of Owings-Sharpe Plastic Pipe & Tubing Company, Magnolia, Ark., spotlighted the tremendous strides plastics have been making as industrial and engineering materials, and is a strong portent of things-to-come. Despite problems and limitations, plant use of plastic pipe and tubing is growing fast (see *Modern Industry*, April 1952, page 50) and Republic's entry into the field to safeguard its pipe and tubing markets will probably spark similar action by a good many metal producing and fabricating companies. Republic, incidentally, is entering another new materials field at the same time: powdered iron. A million-dollar plant is being built near Toledo to turn out this increasingly important industrial material.

• It seems like revival time for many consumer products. "New" designs shown at the recent National Furniture Show and the Lamp Show, and current ads of major department stores, give the impression that the 1890's have re-



Precision plastics

Latest job for laminated plastics—and good example of their engineering possibilities—are these ball bearing ring retainers made by Synthane Corporation, Oaks, Pa., for machine tools, supercharger blowers, aircraft instruments, and the like. According to Synthane, they can be held to tolerances of 0.001 to 0.005 inches (depending on design), will operate at high speed, can be produced in a wide range of sizes.

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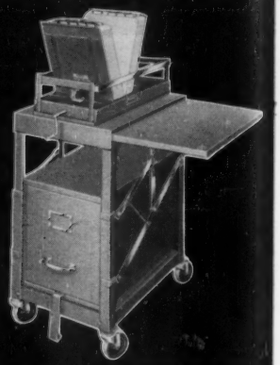

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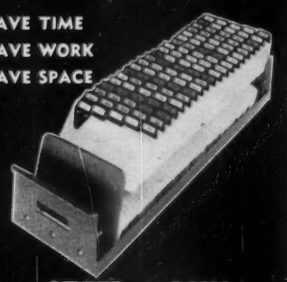

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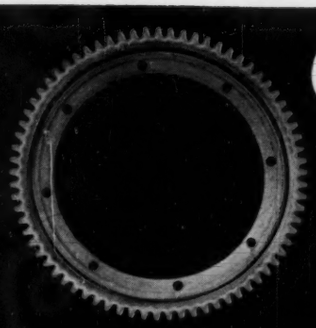
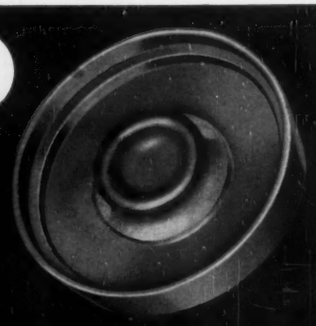
Hardening



Production up from 14 to 35 per hour, and savings of $82,507 per year on this International Harvester gear.

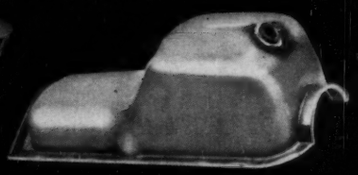
Over 4¢ saved on every part, 600 parts per hour when Lima-Hamilton TOCCO-hardens these shifting levers.



Hardening costs cut 80% by TOCCO-hardening wearing area of Link Belt Company conveyor trolley wheels.

Brazing

Kennametal, Inc. brazes carbide tips on these mining machine bits and hardens shanks at the same time. Output—one every 20 seconds.

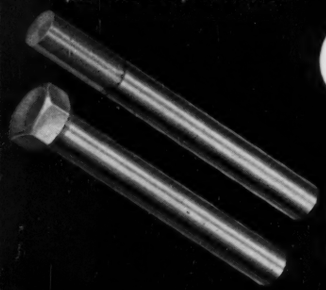


Nash Motors cuts cost 60%, triples hourly output by TOCCO-brazing drain flanges to automotive oil pans.

←TOCCO brazed in 15 seconds.

A 6¢ TOCCO-brazing job saves $17.00 tools—saves $2,000 a month at a midwest automotive parts plant.

Forging

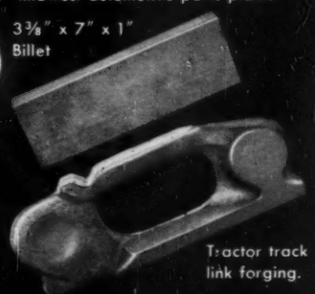


H. M. Harper boosts production up to 265% and die life up to 400% by TOCCO-heating non-ferrous bolt blanks for forging.

Timken bit heated by TOCCO Induction Heating. ←

Bit heated by conventional methods. →

Scale was reduced from 2.79% to .79% by applying TOCCO to heating bar stock for forging rock drill bits at Timken Roller Bearing Company.



Tractor track link forging.

Forging die life tripled and scale reduced over 99% when Willy's Overland Commercial Forge Plant installed TOCCO Induction Heating for forging.

All These Jobs, And Probably Some of Yours, Can Be Done Faster, Better and at Lower Cost with TOCCO* Induction Heating

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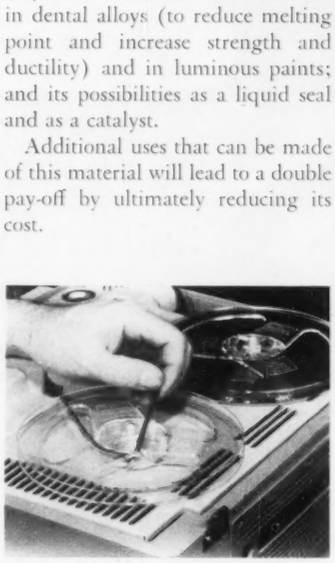
appeared. There are brass bedsteads and wire wheels for autos. Chintz is getting a big sales push. Wrought iron is coming in for plenty of attention, too. It's by no means the only trend in 1953 design—but it's one worth considering.

• Take another look at gallium. This unusual metal is still only-too-available, despite its producers' best efforts (see *Modern Industry*, February 1950, page 70). Alcoa, one of the major suppliers, notes as potentially useful properties the wide range of temperatures over which gallium remains liquid (86 to 3,600° fahrenheit), its mirror-like surface, high thermal conductivity, and unusual electrical performance, but reports there are few takers. One reason: The metal is involved in a vicious circle. Present price is over $1,000 a pound, and it can't come down until there are more users—and there aren't likely to be too many users until it does come down. As thought-starters for possible applications that might pay their way, Alcoa notes use of the metal in dental alloys (to reduce melting point and increase strength and ductility) and in luminous paints; and its possibilities as a liquid seal and as a catalyst.

Additional uses that can be made of this material will lead to a double pay-off by ultimately reducing its cost.



Reel design

It may look simple, but this new reel designed by Minnesota Mining & Mfg. Company for its magnetic recording tape takes a lot of design factors into account. It has to be fast-threading, incorporate recording information, minimize timing errors, promote even winding, resist warpage. To meet these specifications, it has a larger hub, V-shaped instead of straight slots, and wider and heavier spokes than previous models.

1 generalift pallet crate

replaced 6 heavy nailed crates

cut packaging costs 50%

reduced shipping costs 25%

McCord Corporation, Plymouth, Indiana, solved both a packaging and a materials handling problem with the Generalift Pallet Crate shown above. Conferences with General Packaging and Sales Engineers produced a crate which held 24 radiators, packed easily, and could be handled by fork-lift from the shipping room all the way to assembly lines. It formerly took 24 heavy nailed crates and from 24 to 30 hours of labor to ready 96 radiators for shipment. Packing the same number in Generalift Pallet Crates takes only 4 hours.

This is only one example of the many packaging problems solved every day—at a saving—in General Box Company's two fine Industrial Packaging Laboratories. General Box packaging experts stand ready to help *you* cut packaging costs, too. Write for complete details.

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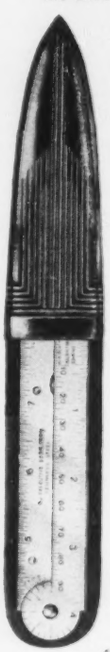

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Handle—folding 8" ruler, a mm. measure and a protractor. Back, a decimal equivalent table and reduction scale. Blank sample — $2.00 postpaid.

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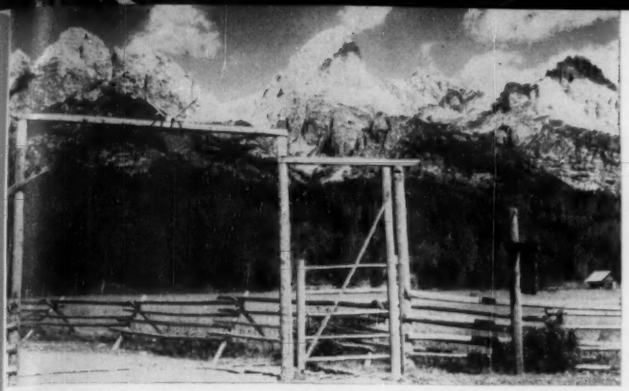

LEE PHOTOGRAPH

Executive BOOKSHELF

In Stitches

Seventh heaven to some, but Gehenna to many in the past, the garment industry is one segment of our industrial life that easily lends itself to the skills of the popularizer. This is quite evident in the new breezily written volume, *Seventh Avenue,* which tells the glamorous, gaudy story of the little center in New York which spawns most of the clothes worn by American women.

Murray Sices, a clothing manufacturer with a penchant for spinning yarns as well as cutting cloth, has effectively illuminated the inner workings of the process of changing cloth into clothes. By stitching together swatches of anecdotes and personality sketches, the author manages to impart an understanding of the elements that quickly turn failure to success in this febrile industry. Rather intriguing are the descriptions of needed innovations which give promise of yielding fortunes to their inventors.

Fairchild Publications, Inc., N. Y., 151 pages, $2.50.

Ask The Risk

While entrepreneurs may be noted for enthusiasm rather than introspection, they would benefit more by asking themselves questions before rather than after embarking upon a new venture. A comprehensive compendium of such queries is available in the new booklet, *One Hundred Questions for A Prospective Manufacturer* by William M. Hoad.

Starting with the seemingly naive question about one's experience, the author goes on to press pointed queries about virtually all aspects of starting and operating a small plant, including financing, product choice, layout, personnel, location, and records. Help in answering any of the questions is provided by listing various sources of information. A close, conscientious study of these queries should do much to prevent the asking of that final, fretful question: "Why did we fail?"

Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C., 36 pages, $.20.

Artful Answer

Revelations of the secrets of success are almost invariably enthralling to aspirants. Such undoubtedly was true when visiting Professor Shepard B. Clough recently attempted to explain to studious Europeans the causes for the gargantuan growth in America's capacity to produce. Now these stimulating lectures are available in the new book, *The American Way,* which is rather refreshing for its aura of detachment.

Despite the slogan-like title, the author carefully stresses that no one cause, such as untrammeled enterprise or bountiful resources, can be credited with the success. Instead he pertinaciously probes the complex of causes and conditions, weighing one against the other to arrive at a tenable explanation. The volume is a strong answer to the harangue of some carping Europeans addicted to characterizing the US as "the only nation which passed from barbarism to decadence without achiev-

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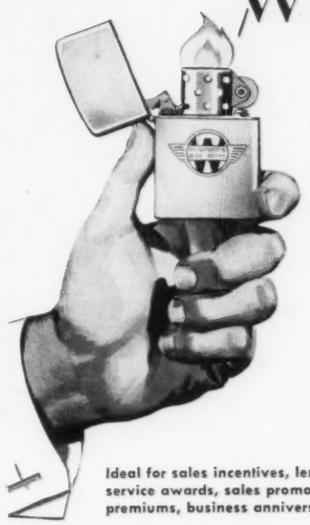

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ing maturity." For the author's documented thesis is that economic greatness precedes and ushers in the full flowering of artistic development.

Thomas Y. Crowell Company, New York, 246 pages, $4.

Thoughtful Tycoons

Plato's vision of philosophers' filling the rôles of leaders may never be realized this side of Utopia. Nevertheless, thoughtful business leaders have in recent years frequently donned the philosopher's thinking cap in forming a conscious, cohesive outlook on the relation of business to society. Many of their pontifical pronouncements are given extended assessment in the new book, *Social Responsibilities of the Businessman* by Howard R. Bowen.

As a professional economist, the author concretely measures the practical limits of the business man's social responsibility, sometimes considered as wide-ranging as an entrepreneur's imagination.

Clearly demonstrated is the evolving self-appraisal of many executives as they assumed increasingly in recent decades the function of professional arbiter of the occasionally conflicting claims of employees, owners, customers, and community. The author's reflection of the growing belief that criteria other than profits are important may prove unpalatable to some readers, but all will value this profusely documented volume as a keen probing tool for the sometimes necessary exercise of soul-searching.

Harper & Brothers, New York, 276 pages, $3.50.

Happy Helpers

Most business administrators are well aware that an arrogant, driving supervisor has the usefulness of a luminous sun-dial. However, unawareness of the less ostensible causes of discord can frequently be blamed for the poor performance of many small companies. While group relations are undeniably vital in businesses of all sizes, they seem to loom much larger in the small, struggling concern, where a plethora rather than a dearth of communications is one of the vexations. That such relations are essentially different in the small company is

Continued on page 108

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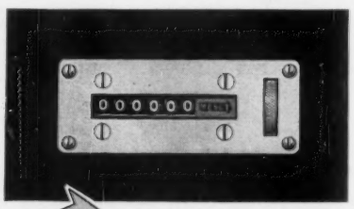

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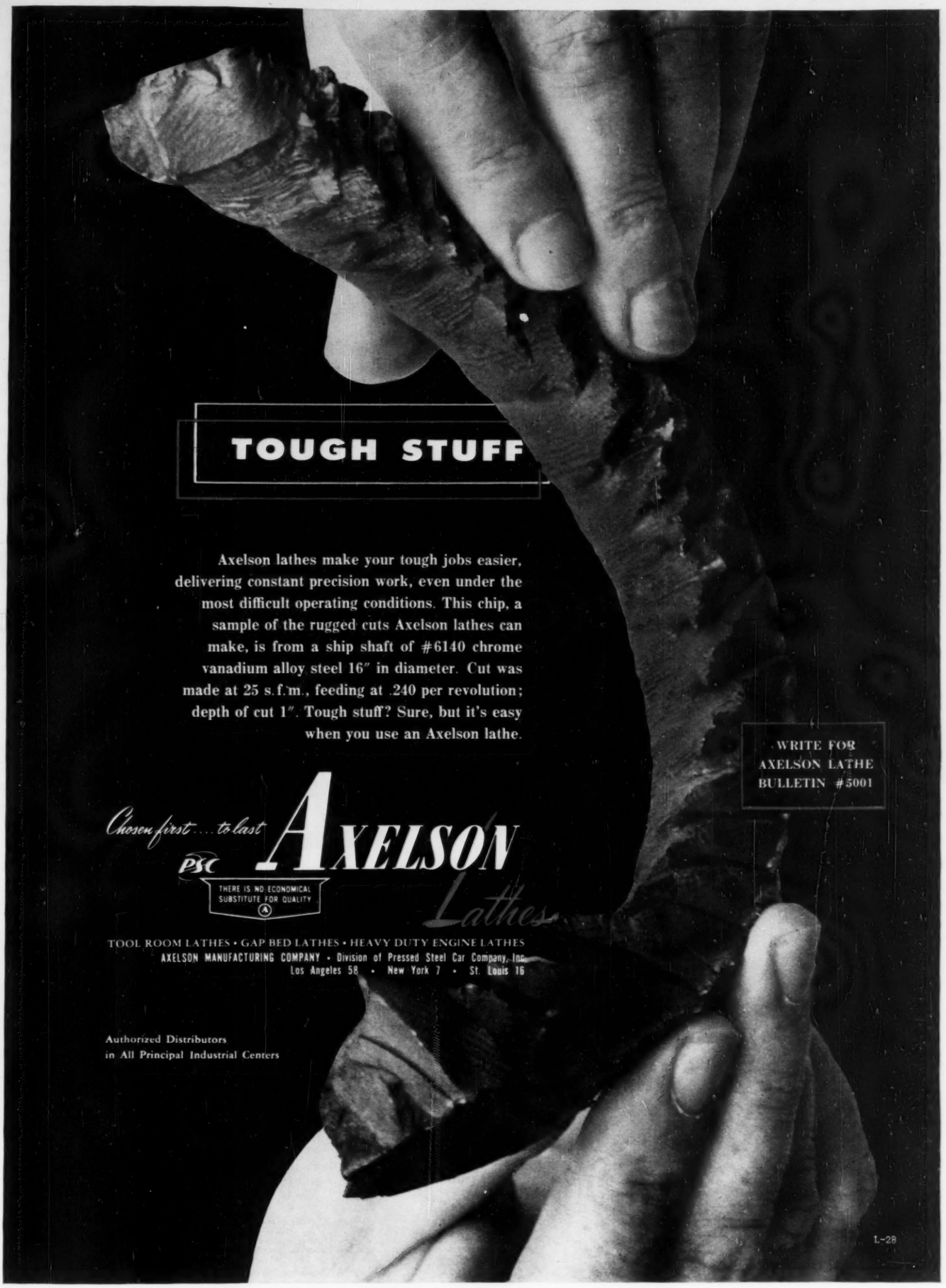
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Axelson lathes make your tough jobs easier, delivering constant precision work, even under the most difficult operating conditions. This chip, a sample of the rugged cuts Axelson lathes can make, is from a ship shaft of #6140 chrome vanadium alloy steel 16″ in diameter. Cut was made at 25 s.f.m., feeding at .240 per revolution; depth of cut 1″. Tough stuff? Sure, but it's easy when you use an Axelson lathe.
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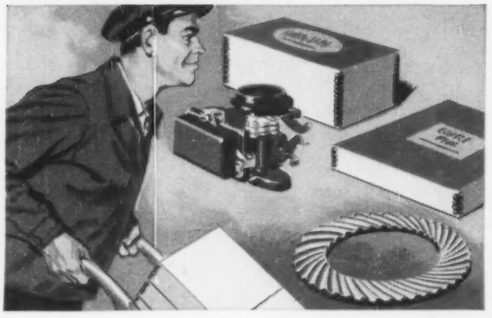

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METAL EDGE

stressed in the new, highly practical booklet, *Human Relations in Small Industry* by John Perry.

By case histories, the author, a management consultant, demonstrates how to develop that most highly prized business skill—the art of inducing people to work together harmoniously and enthusiastically. He emphasizes the quickness with which changes in group relations are translated into profits and losses, and offers means to measure the satisfaction of the working force in the small company. Among the topics treated by the author are possible substitutes for full-time specialists, the costs of turnover, and the dispersal of decision-making.

Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C., 68 pages, $.25.

Financial Finesse

The forbidding fields of finance seem much less so after glancing into the new volume, *Business Finance Handbook*. Edited by Lillian Doris, this tome offers the detailed advice of a score of specialists in the art of getting, keeping, and disposing of that mercurial property, money.

Raising capital, using profits, detecting danger signals, and forecasting sales are among the topics treated. The section on operating ratios should do much to transform the volume into a dog-eared work manual, particularly for the small business man.

Prentice-Hall, Inc., N.Y., 919 pages, $10.

Attitudes Anonymous

Perhaps, some of the past disharmony in industry between the leaders and the led could be traced to the habit of looking upon the work force as an entity complete unto itself. However, such books as *Detroit as the People See It* by Arthur Kornhauser, help to-day's policy planners to develop vivid understanding of the problems and needs of the community and the forces which frequently tip the balance between industrial failure and success.

In this volume are gathered the revealing opinions of a significant cross-section of the people in Detroit about their work, their employers, unions, community problems, and the myriad elements of the modern industrial city.

Wayne University Press, Detroit, 221 pp., $6.

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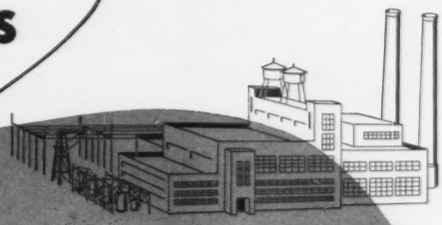
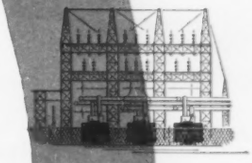


At the generator, in the transmission lines—even in our lamps and appliances—a vast supply of electrical energy is available to serve us safely. But that power, set loose by a short circuit or overload, would be available to burn and destroy, were it not for the protective equipment found wherever electricity is generated, transmitted, and used.



In central power plant, suburban substation, in factory, and in home, I-T-E Circuit Breakers protect valuable machines and vital power circuits. Should trouble develop anywhere, these "breakers" instantly shut off power to protect life and property.

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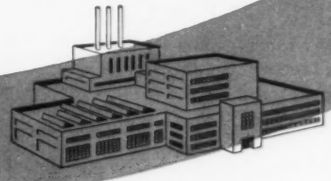

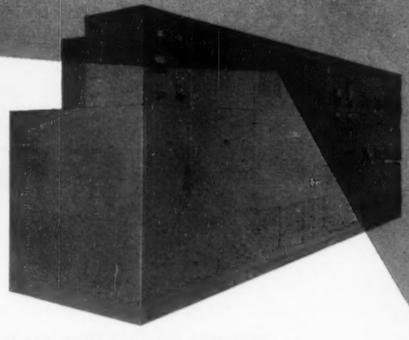

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TO-DAY

Continued from page 47

If the engineering service on a job falls below par, we are able to pick up the telephone and demand immediate and direct action. Here, too, if the service is not improved at once and a good explanation given for current failings, no future business will be done with that particular engineering company.

The daily inspection reports serve also as an open channel for interchange of information and materials among projects. Recently, when one construction foreman requested some special equipment needed for foundation work, he noted that the usual sources of supply were unable to furnish the desired machinery. With this report in hand, the main office sprang into action, calling a dozen or more of its suppliers. The specialized machinery could not be secured immediately from any of the usual sources.

The daily inspection report of another project, however, furnished the solution. This report revealed that the machinery needed had been used on the project. A telephone call revealed further that it was available for immediate shipment to the first project, and within a day the machinery was operating at the project.

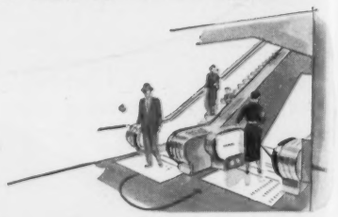
Each member of the top management team sees and reads the daily inspection reports from all projects under construction. In this group, of course, are the divisional managers. When an item on a daily report applies to their department, they are responsible for any requested or needed action.

The net result of this system is clear: No executive need ask, "How are things going?" on such-and-such a project. He knows exactly how they are going every 24 hours.

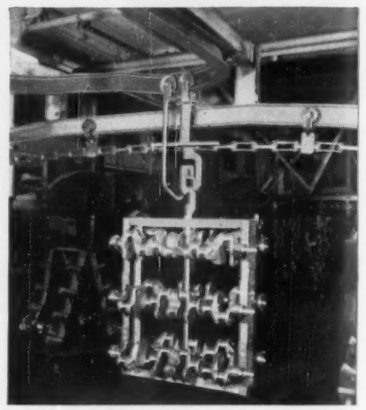
The best system of reports, bulletins, and memoranda is no substitute for personal contact between the men behind the desks and the men in the field. Nor should it be. The "arm chair" executive cannot be depended upon to make decisions, to direct operations in a constantly changing business world. The able executive must go out to the grassroots to see what is happening, to learn first hand if the decisions he makes are the best and are being carried out properly.

In our company, there is a two-

Trans-Free Automation



Trans-Free Conveyor System — automatically transfers loads from main Live Line to Free Lines—and back again.



One of the intermediate production stations in the Allied Trans-Free Conveyor System, showing a rack of parts being transferred from the *Live Line* to the *Free Line*.

At various locations production parts can be automatically removed from the main Live Line to adjacent Free Lines. At these points, intermediate production operations are performed. Upon completion, the loads are automatically transferred back to the main Live Line.

The Allied Trans-Free System is applicable to any type of product, large or small.

Allied are specialists on *Automation* and highly engineered *Load Transferring* material handling systems. Consult with our engineering staff on material handling problems that arise in your plant.

See Allied Catalog 952 in Sweet's Mechanical Industries or write us for a copy

ALLIED

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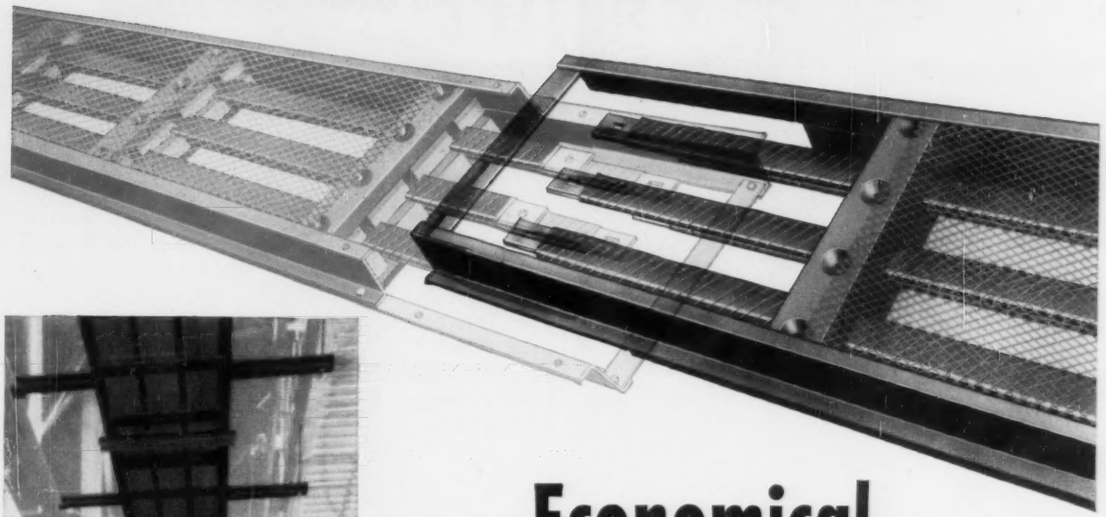
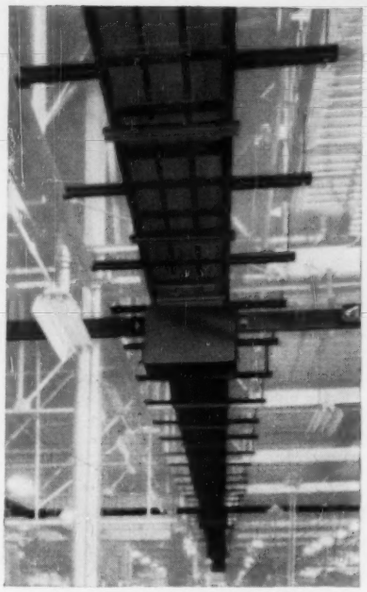
Complete Material Handling Systems

Designed • Fabricated • Erected

BULLDOG BUStribution® DUCT





Prefabricated 10′ sections and standard fittings give Ventilated LO-X Duct complete flexibility. 800A. to 4000A. at 600 volts or less.

Economical
• to install
• to operate

For faster, easier, more economical installation of duct sections, BullDog LO-X BUStribution DUCT uses the scarf-lap joint—a thoroughbred engineering feature that pays off in extra savings for you.

With BullDog's exclusive scarf-lap joint (shown above), duct sections simply overlap and bolt together . . . making a stronger, more rigid assembly. Bulky, complicated joint fittings are eliminated. Savings in time and money are substantial.

Another great economy feature, BullDog's unique paired phasing arrangement, lowers reactance in the bus bars. It assures you the *lowest possible* current carrying cost per ampere per foot.

Get complete information on LO-X Duct (for feeder and welder circuits) and Plug-in Duct (for branch circuits). Consult your nearest BullDog Field Engineer —offices in principal cities throughout the United States and in Canada. Or write BullDog Electric Products Company, Dept. MI83, Detroit 32, Mich.

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Photo: Orange bins at Plymouth Citrus Products Cooperative, Plymouth, Florida.
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KANSAS CITY LOUISVILLE MINNEAPOLIS NEW ORLEANS
NEW YORK PHILADELPHIA RICHMOND ST. LOUIS

way street from office desk to construction site, and it is a well-travelled road.

Direct Contact

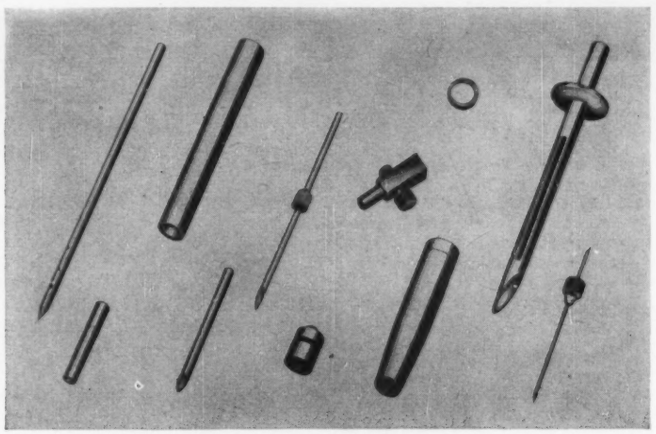
Every member of the managerial force makes it a point to spend part of his work week at the site of the construction project with which he is concerned. He talks with foremen, engineers, laborers, plumbers, in short with everyone working on the project. Quite often, he works out problems right on the spot. He can see for himself exactly what went wrong, if anything, and change orders or directives to correct matters. Thus, our executives talk the worker's language, understand the worker's job, and they know what is going on because they are there.

Each Saturday afternoon the company holds a luncheon meeting with all of our key job construction personnel in attendance. At these meetings, there is a complete airing of problems, and a complete accounting of how the problems were solved. This means that not only do the construction people understand each other's problems, but they know how and why they came about, and how and why they were solved.

At just such a luncheon meeting not long ago, the construction manager for a new project explained the difficulties involved in landscaping the areas to company specifications and yet keeping costs within the established budget. Unusual characteristics of the terrain required more men, more equipment, and more time for landscaping work. It seemed certain that the only solution was to open the budget and absorb the added costs.

One of the executives attending the luncheon recalled, however, a similar situation in a project he had worked on years ago, long before our company even existed. Together, across the luncheon table, the landscaping plans for the new project were revised, and when translated into action they produced a job up to company standards and at no extra expense.

As everyone knows, costs are the major problem in business and industry today, and in the construction field they can be "makers" or "breakers." As an old hand in the industry once said, "In this business, if you count in dollars, you're



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Now you can have better, longer-lasting, non-corrosive parts made of perfect performing stainless steel for about the same price as a comparable plated part.

This means better quality . . . a new standard of performance . . . and extra sales appeal.

And stainless steel need not cost more than plated parts if you buy Bishop "mill pre-fabricated tubular parts." This is because Bishop, one of America's leading stainless redraw mills, is the *only* mill that specializes in specialties.

"Under one roof" re-draw and fabrication facilities mean savings in time, transportation and handling costs.

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Now 3 minutes with push-button brushing

This strip act with Osborn wire brushes is taking off costly hours in the production of d-c motor armatures . . . typical of savings being discovered throughout industry with push-button brushing methods.

The job here is to remove enamel insulation from copper wires to assure top quality soldered connections. Formerly done by a tedious hand-scraping method, the time per armature was 14½ minutes. With the motor-driven brushing device shown the time has been cut to 3 minutes. As the armature is turned, a pair of Osborn Disc Center wire brush heads rotate downward on the wires and the insulation comes off clean.

This is typical of thousands of production jobs which have been simplified with the help of the **O**sborn **B**rushing **A**nalyst. For help to improve *your* cleaning, finishing or deburring operations, call your **OBA** or write *The Osborn Manufacturing Company, Dept. B-8, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

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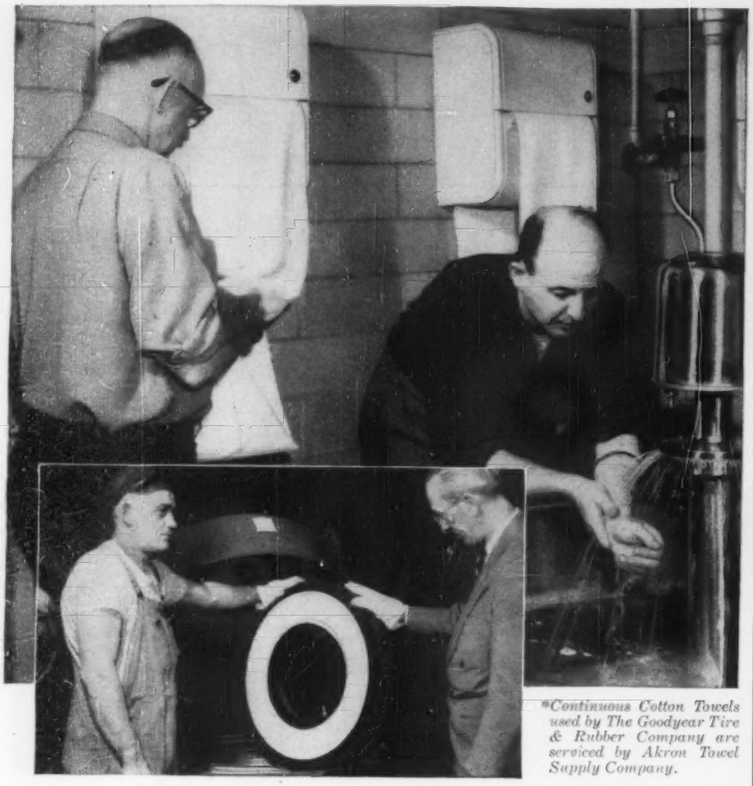
Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES



*Continuous Cotton Towels used by The Goodyear Tire & Rubber Company are serviced by Akron Towel Supply Company.

GOODYEAR Washrooms are Kept Cleaner and Tidier with Cotton Towels*

• The world's largest producer of rubber products, The Goodyear Tire & Rubber Company, manufactures a multitude of things for home and industry, from rubber heels and soles to conveyor and transmission belts. The building of tires is, however, their biggest business. Shown above is a Goodyear white wall tire being removed from a curing press.

Back in '45 Goodyear installed continuous cotton towels in washrooms at Akron to help keep these busy service rooms cleaner and tidier. *Goodyear maintenance supervisors are now more than satisfied that cotton towels better serve their needs for efficient towel service.* Their employees appreciate the greater comfort afforded by soft, absorbent cotton towels.

Whatever your towel problem . . . whether you operate a factory, institution, office or store . . . you can be sure that soft, gentle, absorbent cotton towels will do the best job in promoting employee morale, building customer good will, increasing tidiness in your washrooms and cleanliness among your employees.

Local service is listed in your classified book under SERVILINEN, LINEN SUPPLY or TOWEL SUPPLY.

For free booklet that tells how cotton towel service will save you money and increase sanitation and efficiency, write Fairfax, 65 Worth Street, New York 13, Dept. M.

Clean Cotton Towels . . .

Sure Sign of Good Management

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sure to go broke. If you count in pennies, you stand a chance of breaking even. It's when you start counting in penny-nails that you have a better-than-average chance of seeing some profits." And to anyone in the construction industry, the term "penny-nail" is a gross misnomer, and any purchase order for nails will prove it.

In our organization, all heads are pooled in estimating job costs. First crack is given to the executives of the various divisions concerned with the project. When their estimates are completed, the men in the field force are called in. From this group comes a second set of estimates of both cost and time.

Then, taking a leaf from the operations book of the Congressional branch of our Federal Government, the estimates go into a joint committee meeting, composed of the combined forces. Here, a figure is set and agreed upon for each item of work on a project. Time schedules are also drawn up. Before the meeting breaks up there will be established a complete cost estimate and time schedule for the project.

The company goes all-out to keep

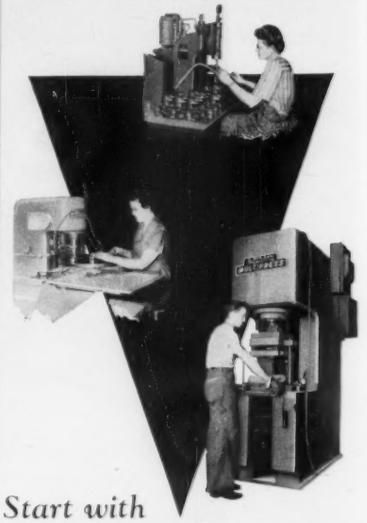
The AUTHORS

JOSEPH H. KANTER is a native of Alabama and the younger member of the partnership by five years, being 28 and a veteran of the United States armed forces. His studies at Georgetown University interrupted by the military, he turned to real estate upon his discharge, while administering the estate of his deceased father. In 1947 the real estate development was started in partnership with . . .

MARVIN L. WARNER, also a native Alabaman and holder of BS and LLB degrees from that State's University and an LLM from George Washington University. During his tenure of service with the United States Army in World War II he attained the rank of Major before being discharged. In 1946, Mr. Warner was associated with the Warner Realty Company, staying until 1947.

The partnership, organized by veterans and employing mainly veterans, is youthful and understands and uses the better aspects of military organization and teamwork. Both men are members of the growing Young Presidents' organization.

Are you pressing to cut costs?



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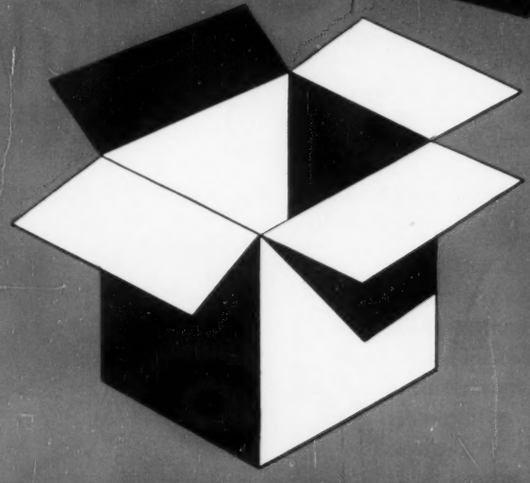

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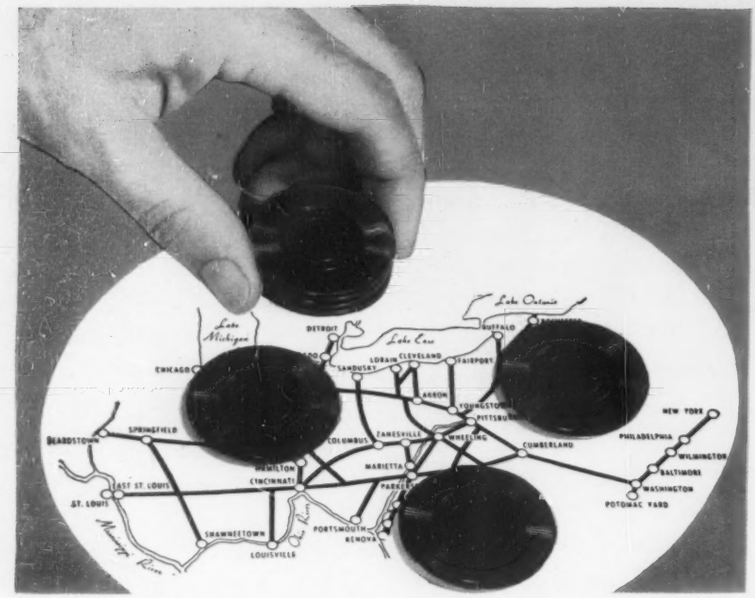

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Along the friendly, *modern* B&O is many an "aristocrat" of *industrial America*. The "blue chip" corporations gained eminence through the know-how of production men and the judgment of management. We're *proud* of the "blue chips" who chose B&O territory for further expansion. They accepted the advice of our specialists in site selection.

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within the set and agreed upon estimates. The progress of the project is checked daily, and any lags in schedule or any excesses in costs are quickly spotted and called to the attention of all concerned. The men responsible for the work on the project are told right from the start that they are being judged on the basis of the agreed upon estimates and whether or not they will meet these goals.

Works Both Ways

Yes, the company is quick to call for explanations when estimates are exceeded, when time schedules are not maintained. But it is just as quick to pass our promotions and bonuses for jobs done on time and within budget limitations. Actual size of the bonuses is determined by just these two factors: time and costs.

To house all the reports, meeting minutes, memoranda, correspondence, and so forth of each project requires a sizable filing system. To keep that house in order requires not only adequate personnel but an up-to-the-minute, fingertip filing system.

Long ago we learned that a file is nothing more than a drawer filled with papers unless you can get what you want, just when you want it. Since we depend so heavily upon our files—we call them our "experience"—we strive to make them as useful as possible.

The system is a simple one, though by no means an inexpensive one. Each project constitutes a complete file. Within each file—and it is never less than several cabinets full—the major classifications

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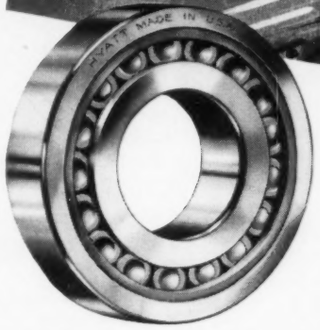

When competition gets tough—when buyers compare *quality* as well as price—"Hyatt-equipped" is a recognized guide to top value! That's because business men know that *Hyatt* bearings are *better* bearings—performance-proved to last longer at peak efficiency! And they know also that Hyatt bearings are a reliable indication of *extra quality, longer life,* and *lower maintenance costs* in any product they buy or sell! For cylindrical or spherical roller bearings, HYATT is the name to remember! *"If it's built with Hyatts, it's built to be the best!"*
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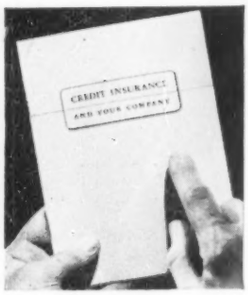

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are by types of work, such as design, engineering, construction, renting, management, personnel, and so forth. And within each of these classifications, there are still further break-downs or subdivisions.

Case Histories

Once a project is completed the entire file becomes our "case history," and it is kept ready for use at all times. For these "case histories" contain our problems—what went wrong and what went right—and our solutions to them.

In our "case histories" there are many instances where the problem was a personal one. This we are proud of, for it has been the company's policy from the first to keep the road to top management open for the individual's troubles and problems, as well as for the company's.

From the start of our company, six years ago, we learned that if there is a formula for success in business today, it is primarily a human equation. Too often, we found, the strides made in management methods and techniques left in their wake the need for better relationships between management and employees. The best product, the most efficient punchcard system, the finest machines will not create an iota of interest, enthusiasm, or company spirit unless the personnel from top to bottom are happy and content.

What does it take to keep some 125 administrative people plus a field organization ranging from 200 to 400 more, happy and content? Well, let's see what our files show.

We recently received the following letter from the wife of one of our engineers in a field office:

"I am writing to you in regards to a letter which was supposed to have been written to you by your office here and it concerns a raise for my husband." She went on to say that she felt free to approach the main office on the matter, and she felt certain, too, that she would get an immediate answer.

The letter was acknowledged at once, assuring the woman that the company would take such action as it considers satisfactory and fair to all concerned. But what particularly disturbed management was the fact that our field representative had not informed us of the matter. We checked and found that he was at

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It takes a delicate touch and years of experience to master the art of formulating and processing certain types of steels . . . like those used in fine cutlery, clock springs and TV magnets. These and hundreds of other specialty steels must be tailored to fit their ultimate use. For example, the cold rolled alloy steels needed for cutting such everyday items as bread, meat, paper, shoe leather and fabrics have to possess special qualities not found in ordinary steels.

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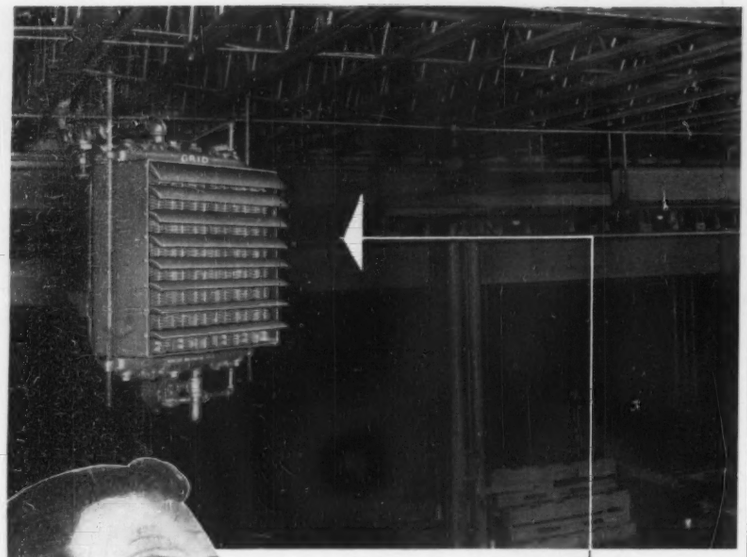

Put up to Stay up

trouble free service for over 22 years...that's only one record for...

GRID UNIT HEATERS

That's the experience of a large midwest manufacturer. Twenty-two years of service without need for repairs prove to him that, with a GRID installation, first cost is last cost. Such service records (GRID installations made in 1929 are still operating) are the rule rather than the exception with GRID Unit Heaters because GRID was deliberately designed to be a better unit heater. To provide not only ample, comfortable heat, but to give years of service without the usual high maintenance cost generally experienced with ordinary unit heaters.

Such service records occur because GRID is completely different from other unit heaters — here's how:

GRID is an all cast unit with finned heating sections and headers tested to withstand steam pressures up to 250 # P.S.I.

GRID construction uses no brazed, soldered, rolled or welded connections between condenser and headers. A specially designed threaded nipple assures a precision, leak-proof fit.

GRID construction has all similar metals in contact with steam, thus preventing electrolytic corrosion which eventually occurs in copper type unit heaters where steam passes from iron pipes into copper cores. (Write for booklet CORROSION IN UNIT HEATERS.)

GRID construction resists corrosion from fumes present in most types of industry.

GRID design incorporating low outlet temperatures, proper fan sizes and motor speeds, assures delivery of warm comfortable air in ample volume to the working level. No stratification of warm air at the ceiling to waste your fuel dollars.

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fault, which is just another way of saying that the company was to blame. We took steps to avoid any future delays of this type.

While the engineer did not receive the raise immediately, for reasons which we explained to him and his wife, the latter was well satisfied with our quick and frank reply. When she wrote to us again, we knew that we had not only handled the matter fairly, but had created a loyal and satisfied employee as well.

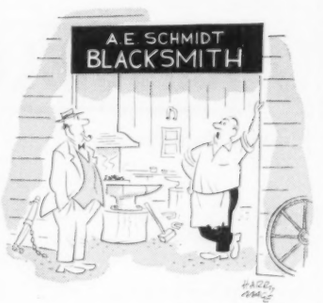
Good Listeners

It can be stated accurately that we invite troubles—specifically, the troubles of our employees. Whether it concerns their work, their progress, their personal life, makes no difference, for we are ready to listen to any problem of anyone in our organization.

In effect, this can be called our policy of "What went wrong with *you* to-day?" But under our system, an employee is asked to submit along with his troubles suggestions for their solutions. We have found, whether the problem is a business or personal one, the requesting of recommendations for solutions from employees develops initiative and independence. We work closely to solve an employee's problem, but it is a co-operative job. Our company offers no lap for problem-dumping.

At present, the company is negotiating for the purchase of land which will be the site of the largest project in our history. We approach this project with confidence, for while we will make mistakes, we will be the first to know about them and take the needed steps to rectify them. Each and every day we will continue to ask: "What went wrong to-day?" It is our hope and intention to make it right to-morrow.

THE END



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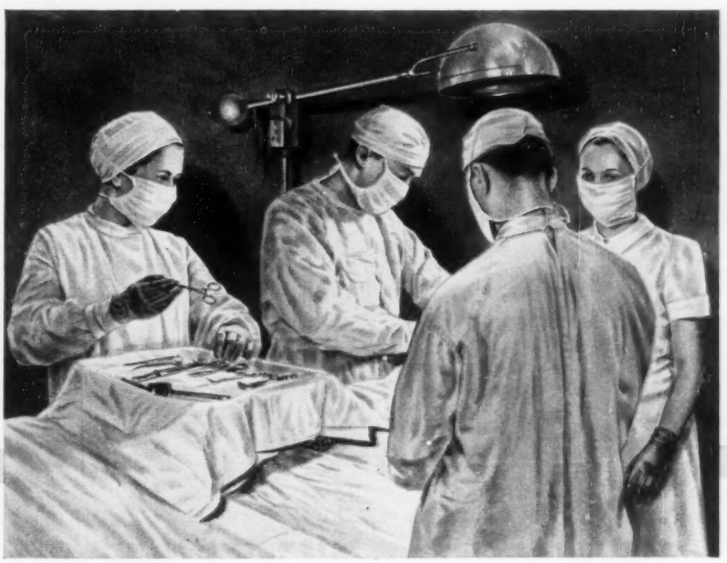

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PRODUCTION METHODS

Different ways to pulverize materials; coating clothes protects workers from burns; uses for submerged combustion; space problem solved.

New light on grinding, crushing

Turning chunks and hunks of material into granules and powders is a many-sided problem to which a great variety of solutions are now offered.

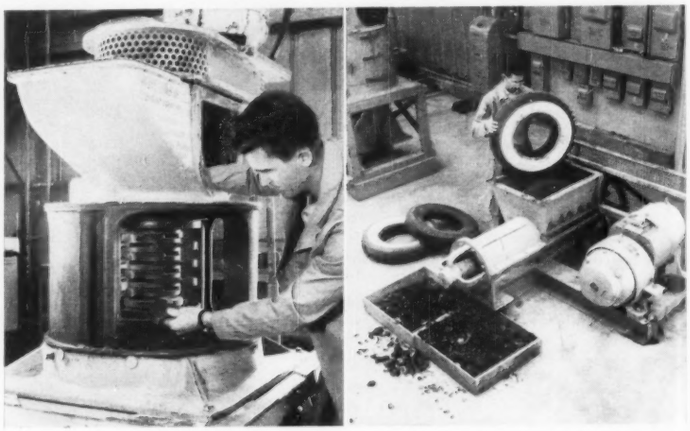
When particularly small size is required—or when the material being ground may be damaged by heat—liquid-nitrogen pulverization may be used (see *Modern Industry,* February 1953, page 40).

In most cases, though, mechanical methods—mills, jaws, and hammers—are used. For instance, the photo below (left) shows a Rietz "Disintegrator" which is a combination of a rotating shaft with hammers attached to it, surrounded by perforated screens. It's used to process chemicals and grains, and in a California winery, for instance, it supplants conventional crushers and presses to increase the yield and cut down labor costs.

But the disintegrator is only one of many types of pulverizing machines. P. H. Mulcahy of Rietz Manufacturing Co., Santa Rosa, Cal., in surveying "size reduction" methods, lists no less than a dozen types of machines for making small particles out of big ones. He includes mills and crushers which use rolls, jaws, balls and pebbles, discs, hammers, knives, and many combinations.

For example, among the new machines being offered for size reduction are:

- A German-developed pulverizing machine which uses a high air current to achieve an effect similar to the ricochet of wind on rocks and sand. The "Turbo-Mill" which will be distributed here by A. E. Poulsen Co., Los Angeles, Cal., has been used in turning old shoes into synthetic leather and scrapped lumber into pressed wood.
- A mill which uses centrifugal force to recirculate particles for regrinding, and classifies particles by means of an air stream is the "Superfine" pulverizer by Schutz-O'Neill Co., 319 Portland Ave., Minneapolis 15, Minn.



Disintegrator (left) uses fixed hammers to grind material. Often, bulkier masses are first crushed with a Rietz prebreaker (right).

Workers get better protection from burns in the heat of still-warm furnaces (see item below) by coating their cotton work garments with new Treesdale flameproofer compound.

• Grinding to one-micron fineness is said to be possible with the Austrian "Microna" which uses a regulated air current instead of sieve sheets for classifying particles. The American distributors, Seanor International, Inc., 11 West 42 St., New York 18, N. Y., say that required fineness can be obtained in one process directly from the grinder—without sifting.

• For large-scale reduction of metal turnings, aluminum castings, and other scrap at rates of from 35 to 50 tons an hour, the "60-50" rolling ring crusher is offered by American Pulverizer Co., 1249 Macklind Ave., St. Louis, Mo.

• A small (41 lb.) grinding mill for laboratory or control work is less than two feet high and uses a Carborundum stone. Made by Morehouse Industries, 1156 San Fernando Rd., Los Angeles 56, Cal., it can turn out one to three gallons an hour depending on the material.

New auxiliary machines are coming along, too, to work with grinding mills. One type, for instance, breaks up larger materials into chunks that can be handled by standard size-reduction machines (see page 122, right).

How does one pick the right size-reduction method? Suggests Mulcahy:

Cut through the mumbo-jumbo that exists in different industries: terms differ from field to field and the literature is often obsolete.

Consider each operation as a part of a complete process and not as a separate job.

Recognize that sometimes it's cheaper and better to do a reduction in five steps than in two. Don't try to do everything at once.

Protecting workers from burns

Despite the best safety methods, heat and flame will pose plenty of problems in a good many industries. That makes claims for a new, durable flameproofer for cotton work clothing (photo above) well worth investigating.

According to Treesdale Laboratories & Textile Processing Co., Pittsburgh 22, Pa., which developed the new flameproofer, treated cotton work clothing will resist fire at temperatures well above the melting point of steel, and has little or no afterglow. In addition, says Treesdale, the treatment appears to combat mildew and prolong the service life of garments. Its biggest feature, though, is its durability to laundering as well as dry cleaning. Treesdale executives claim that garments which have been laundered as many as 25 times still give a considerable degree of protection.

Garments treated with Treesdale compound "Permaproof 300" have been under test in several steel mills for the past five years, and reports are decidedly enthusiastic. For instance, Jones & Laughlin safety experts report that a knee-length coat of treated cotton backed by aluminum foil makes it possible for repairmen to work in still-warm furnaces—at 700 to 800 degrees

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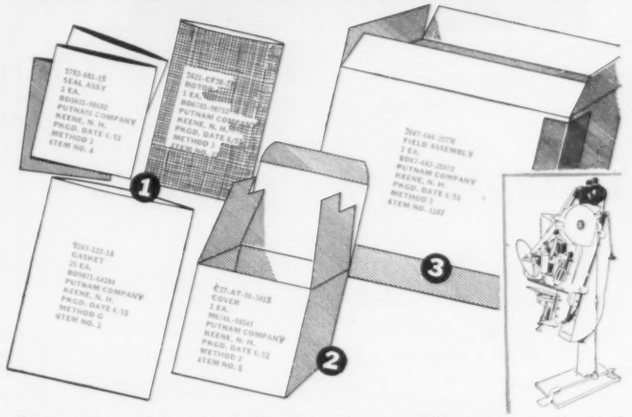

In contract and export packing of parts, assemblies, etc., certain JAN specifications call for three packaging stages: (1) enclosure in scrim-back or polyethylene lined *heat sealing* envelope, (2) intermediate packing in a folding box, (3) final packing in corrugated carton. Each of these three types of containers must be marked for instant and *permanent* identification. Many manufacturers, dissatisfied with conventional marking with crayon, stencil, labeling or other form of hand stamping, have not only found great savings in time and money, but also obtained more legible, longer lasting identification using a Markem Method. *One* Markem machine (with appropriate Markem type and Markem ink) prints desired information on *all three* containers. The vapor barrier of the envelope is not broken. Desired information is changed rapidly. By printing quantities of containers as and when needed, inventory problems are minimized. In this way, the Markem Method insures *positive identification* when the items reach their destination.

MARKEM MARKS THEM ALL

CAN MARKEM HELP YOU? Identification printing for contract and overseas packaging is but an example of how Markem solves industry's marking problems. Markem has been providing industry with production techniques and equipment to identify, decorate or designate its products, parts and packages since 1911. Markem also provides technically trained men who are available in your area to assure *continued* satisfaction with Markem methods and equipment.

When *you* have a marking problem, tell us about it and send a sample of the item to be marked. Perhaps a complete Markem Method has already been developed to solve your problem. If not, Markem will work out a practical solution.

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Accrued Interest Receivable and Other Assets	6,076,373.34
Total Resources	$1,201,070,287.24

Liabilities

Deposits	$1,115,892,216.54
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PRODUCTION METHODS

continued

fahrenheit—for two or three minutes at a time, instead of the 10 or 15 seconds which was all that was previously possible.

Treesdale does not make or sell treated work clothing, but it is now supplying the treatment compound to a number of textile finishers. It costs 3 or 4 cents a yard, and can be applied by standard equipment. Company executives won't tell exactly what the compound contains (the patent is pending).

Solving elevator space shortage

An industrial truck maker helped a Chicago manufacturer solve a space problem in a way that others may find useful. When the powered platform trucks that were required for 4,000-lb. loads turned out to be 17 inches longer than the depth of the elevator platforms, the manufacturer called in Elwell-Parker Electric Co. engineers.

The recommended solution: a truck with a hinged platform that folds back 17 inches. Also, the operator's pedals are hinged for good measure. Extra cost: about $200.

Industrial snapshots

This giant (29 foot) template camera is being used at Convair's San Diego, Cal., plant to make full-scale mockups from drawings and loftings of any size or scale. Built by Consolidated Photo-Engravers and Lithographers Equipment Co., the camera has a 5 by 12 foot copyboard, is also used to make shrink reproductions (for casting) to fine tolerances; reduce large charts to any scale; and in production of silk screens, multilith plates, and so on. Aft view shows film holder (right) which is held in place by a vacuum.

Continued on page 128

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"Torpedo"—Baker designed and built racing car sped 10 miles in less than 5 minutes. Top estimated speed was 132 MPH.

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SHOW-CASE ON WHEELS

First American car commercially equipped with closed body. One of the finest autos of its day, with spacious windows and smart interior. Many still in use!

tops in 1916

. . . and TOPS in 1953 with modern industrial trucks

In its first 100 years Baker has made many notable contributions to the science of transportation and material handling. Today, however, our management is looking *forward*, rather than reflecting on past achievements.

Entering our second century, we are in the midst of a revolution in material handling techniques. New developments are continually expanding the cost-cutting possibilities of mechanized handling. It is our policy to aggressively aid and abet the rebels in this revolution.

Baker's modern line now includes fork trucks, low and Hi-lift platform trucks, crane trucks and tractors. Present models are being constantly improved and new products added—the latest a gas-powered fork truck with automatic transmission.

We have recently acquired Lull Manufacturing Co. (now the Baker-Lull Corporation). To Baker's reputation of "Tops on the *INSIDE*", Lull now adds "Tops on the *OUTSIDE*" with pneumatic-tired front end loaders, fork trucks, and side loaders.

Write for *your copy of the "Baker Handling Library" a new portfolio of actual case histories.*

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Material Handling and Construction Equipment

Baker
industrial trucks

RCA "400" Projector, the thread-easy way to show sound films. Thread-Easy film path makes threading a simple, understandable operation. You can thread it, and *put a picture on the screen* in seconds. (In tests at a trade show, 473 guests proved you can thread the RCA "400" in less than 30 seconds.)

Gentlest way to handle films

IN YEARS TO COME, you'll appreciate the careful way your RCA "400" projector handles film.

Slow-running sprockets—twice the size of ordinary sprockets—provide a long, gradual curve for film to follow. The thread-easy film path does away with sharp bends which tear or scuff film. It's designed to give you hundreds of first-run showings from every film.

(*In actual tests a film—run through the RCA "400" projector 700 times—shows no sign of wear. Splices fail to show any sign of parting after hundreds of passes through the projector.*)

For careful film handling, tell your RCA Dealer you want the RCA "400" 16mm sound projector.

Check these 6 important advantages of the RCA "400" Projector

1. Thread-Easy film path for 30-second threading
2. Low-speed induction motor for quiet operation
3. Floating sprockets for gentle film handling
4. Husky motor, nylon gears for long-term dependability
5. Simplified design for 2-minute set-up, 3-minute pack-up
6. RCA-engineered sound system for superb reproduction

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continued

Pollution solution?

The new combustion catalyst introduced by Oxy-Catalyst, Inc., about a year ago is now being tested in a number of operations—oil refining, electrical insulation, and, as pictured here, coffee roasting. These smokestacks are both connected to coffee-roasting lines; but the one at the right has the alumina-platinum catalyst installed. According to the maker, this method of pollution control—by oxidation of the fumes—is less expensive and more effective.

Submerged combustion

There are a good many ways to heat liquids, and the proponents of each are, of course, partial to their own methods. Here's how one manufacturer sums up the advantages of his method—"Submerged Combustion"—in which the heating unit is plunged in the liquid being heated. Says Submerged Combustion Co. of America, Inc., Hammond, Ind., there is less corrosion, little radiation loss, lower fuel costs. Among the applications the company recommends are:

1. Chemicals: For heating corrosive solutions, thermal efficiency is improved and replacements due to corrosion held down.

3. Paper: For evaporation of waste liquors to reduce volume for disposal.

4. Water: For generation of low-pressure steam or for distilling water containing salts or other matter

Your products are judged on over-all performance . . . *including the wheels they roll on!* For dependable quality, at moderate cost, it will pay you to investigate *performance-proved* Goddeyne Wheels! Built to stand up under continuous use and rough handling, Goddeyne wheels give positive assurance of extra-long service life. 6" to 16" O.D. meets design requirements of virtually all materials handling and industrial equipment, as well as a wide range of farm operating equipment. Special sizes and types are available on request.

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YOU HAVE TO GO
underfoot . . .

TO LICK THIS
overhead!

Read how LEGGE Safety Maintenance Ends *Slip-Accidents* on Your Floors

The polish on your floors may be inviting expensive damage suits. Because walking feet make most polishes slippery as a skating rink.

One building averaged 2 liability claims a week. With LEGGE Maintenance they have had *no slip-falls, no claims.* LEGGE Safety Polishes go up to 75% beyond Underwriters' Laboratories requirements for slip-resistance. Buffing and walking actually *increase* slip-resistance.

BEWARE OF CURE-ALLS: There's more to it than just using a product labeled "slip-resistant". *No two floors are alike.* That's why a LEGGE Safety Engineer examines your floors for age, composition, area, condition and traffic load before specifying the materials that suit your needs *alone.*

Discover how *you* can end the threat of law suits while actually cutting your maintenance costs *way down.* Write today for the informative, Free booklet, "Mr. Higby Learned about Floor Safety . . . the Hard Way!"

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LEGGE SYSTEM of Safety Floor Maintenance

Walter G. LEGGE Company, Inc., Dept. G-8, 101 Park Ave., New York 17, N. Y. Branch offices in principal cities.

PRODUCTION METHODS

continued

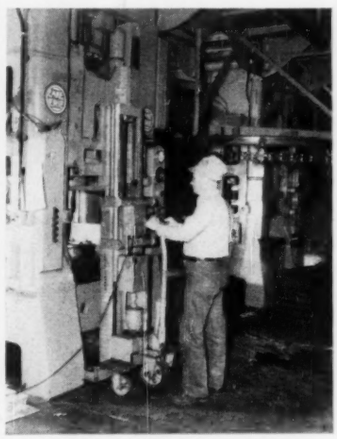
which preclude use of ordinary boilers.

Know-how library

HEAT TREATMENT: Annealing, hardening, martempering, austempering, and surface hardening are explained in new 48-page booklet which includes many illustrations and charts. *Principles of Heat Treatment* is from Meehanite Metal Corp., New Rochelle, N. Y.

PACKING AND SHIPPING: Pocket-sized guide (40 pages) shows typical steel-strapping applications, suggests carloading procedure, describes strapping tools, seals, dispensers, cutters, and staplers. *Guide to Better Packaging* (*Catalog No. 15*) from Signode Steel Strapping Co., 2600 North Western Ave., Chicago 47, Ill.

CONVEYORS: Illustrated booklet (16 pages) shows various practical uses for conveyors in brewing, bottling, chemical, paper, textiles. From Alvey Conveyor Manufacturing Co., 9301 Olive St. Rd., St. Louis 24, Mo.



Cuts costs and fatigue

By combining power lifting with manual transportation, a kitchen equipment maker uses an electro-hydraulic unit that meets overhead clearance limitations, yet makes his die-handling easier. The telescopic stacker, made by Lewis-Shepard, Watertown 72, Mass., uses forks to grip the dies, saves the operator fatigue of loading up to 1,000 lbs. at a time. Stacker collapses from 8½ to 5 feet.

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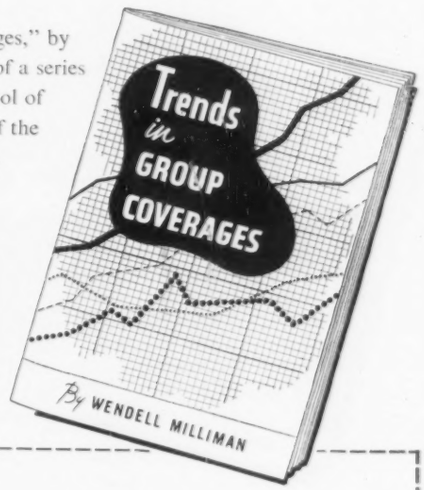

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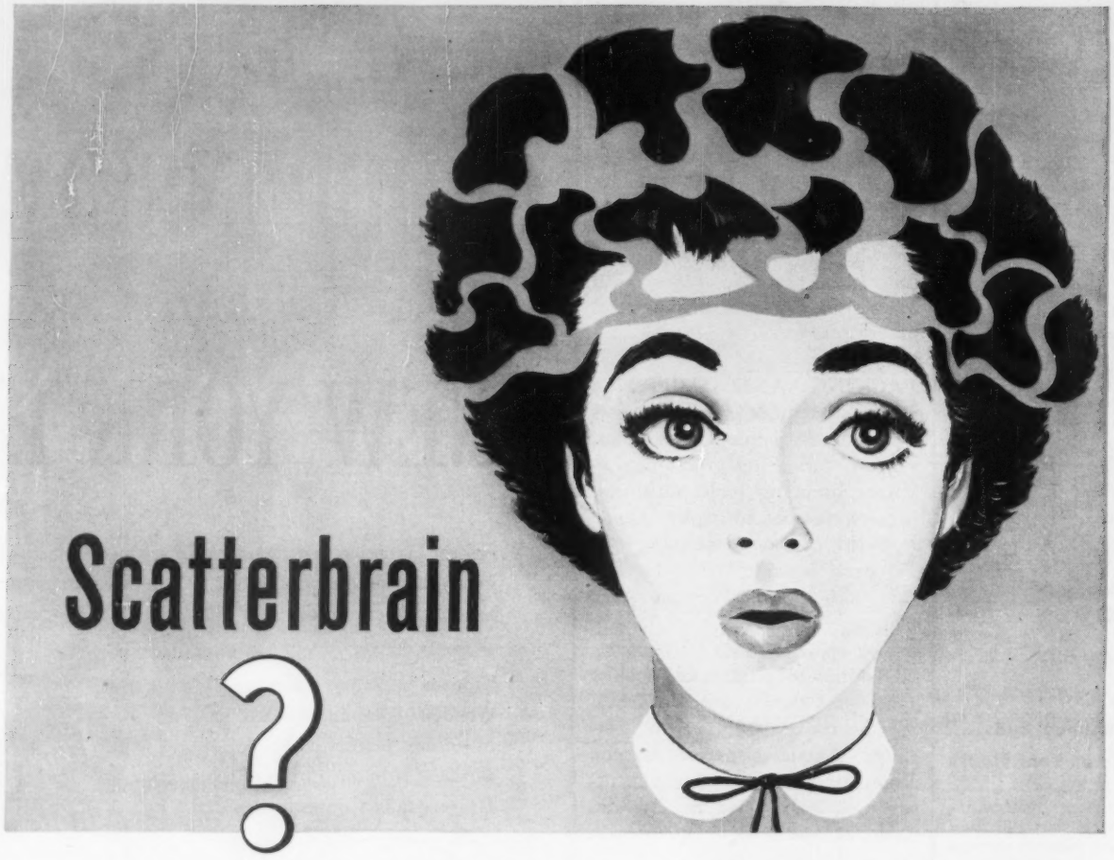
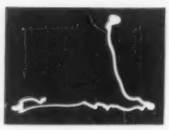
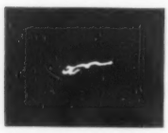


...not when you get her a MONROE



Head motion required on extra keyboard machine: head and eye must move constantly from one to the other; thoughts are scattered, work is harder, more complex.*



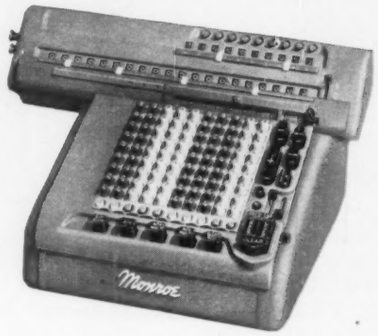
Head motion required on Monroe single keyboard machine: head motion is six times less! Thoughts are concentrated; work is easier, more efficient, more accurate.*

Don't blame the poor girl if hard-to-work keyboards make calculating costs soar. Could be, she's worn out with all the unnecessary physical motion required to operate extra keyboard machines. She'll have a much easier time keeping her thoughts together, and fewer headaches, when she uses a Monroe.

It's simple arithmetic. The Monroe fully automatic calculator eliminates countless separate operations, drastically reducing the amount of physical effort required. Obviously this involves less hand work. And, equally important for the operator, *it greatly cuts down on head motion.* That's the tiring part of extra-keyboard operation; that's where errors creep in—the slips betwixt the hand and the head!

So, by cutting down on all motion, Monroe means *less operator fatigue, more efficient, accurate work.* You get *more output* at less cost.

Another big Monroe exclusive: all zeros and decimals are handled automatically on the single keyboard! Figure on cutting *your* calculating costs. Figure on seeing your Monroe representative soon. Just telephone your local office. It'll pay you.

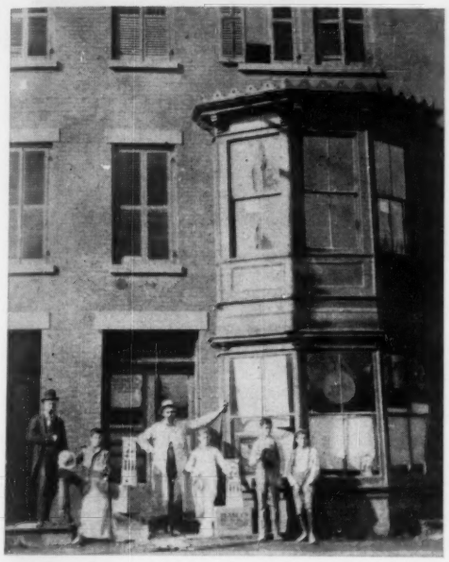


CALCULATING • ADDING
ACCOUNTING MACHINES

*Tracer light photos made by U. S. Testing Co. on the same routine figure problem show how much less work is required to operate Monroe's single keyboard.

MONROE CALCULATING MACHINE COMPANY, INC., ORANGE, NEW JERSEY

For first time, manufacturing, warehouse, administration operations are under one roof. The building is banded by ribbons of glass block.



Another first: The original plant of firm which got its start by manufacturing Corn Killer.

PHOTO VISIT

MENNEN'S NEW FACE

THE Mennen Company, manufacturers of men's toiletries and baby products, is now settled comfortably in its new home in Morris Township, N. J.

The building proves that much thought was given to the maintenance crew as well as to colors, light, and equipment. Maintenance's job is much easier now:

Set-back cement platforms act as dust barriers to steel lockers set on top of them;

Ceramic and asphalt tile, and sound-proof acoustical board, used wherever possible, eliminate a lot of the maintenance painting burden;

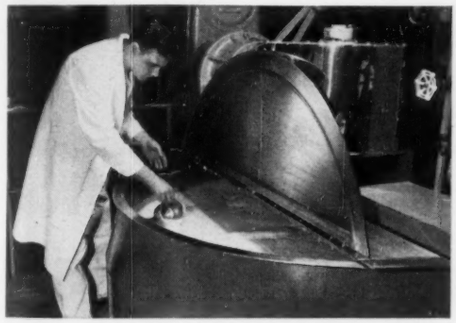
Service closets are located strategically all through the office area;

Everywhere are extra-wide aisles, especially in the warehouse section;

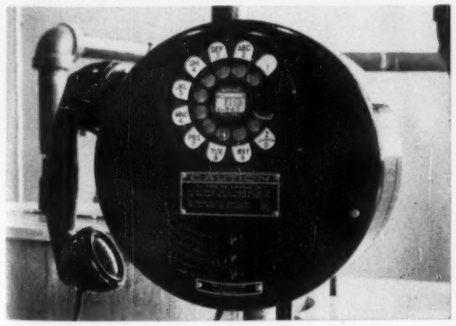
The garbage-disposal dock is placed so that the contractor can pick refuse up at night without coming into the plant proper;

A special floor, almost dust free, makes cleaning the powder manufacturing room (usually a problem child) much simpler.

continued on next page



Chemist samples shave cream made in equipment that's far cry from Corn Killer days.



More of the latest equipment: an explosion-proof phone in alcohol-manufacturing room.

Newest methods go with the new face. For example, man (right) calls out order make-ups over address system to stock men along conveyor that carries orders to trucks parked in nearby bays.

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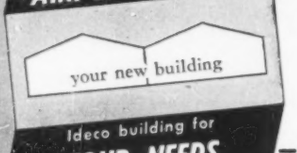
Ideco... the *permanent* steel building... *prefabricated* standard units... *especially planned* for your long-range needs.



Whatever industry or business you are in, Ideco steel buildings . . . custom-planned, permanent . . . offer the sensible answer to your building needs.

Ideco buildings are planned for your particular requirements . . . using predesigned Ideco building parts. Their clean lines and modern design give them a trim business-like appearance inside and out . . . you and your Company can be proud of your Ideco building.

Ideco's deep-rib sheet for sidewalls and roof can bear greater loads than ordinary corrugated sheet . . . means fewer structural members . . . cuts erection time and saves material . . . often makes possible a greater open floor area. All exterior structural members are hot-dip galvanized for complete weather protection . . . keeps maintenance costs at a minimum.

When you begin thinking about your new building, plan wisely . . . plan for the years ahead. There's an Ideco permanent steel building that will meet your special needs now and in the future . . . shop-fabricated to eliminate costly field fabrication . . . speedily erected by unskilled labor.

Ideco's square column deep-rib sheets bear heavy loads . . . long over-lap square joints keep out wind and moisture.

Request your copy of Ideco's informative book "Steel Buildings"

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continued

Directing visitors from lobby is easy because of directional color plan. Receptionist says, "Take green hall, turn left on yellow."

For light, gay mood in which to work, office and hall colors vary as do floor tile designs. Some colors: tan, green, white, brown.

Good lighting is all over. Note abundant glass brick in packaging room; egg-crate ceiling lights (easy upkeep balances high price).

men and **methods** make the difference

Few undertakings are of more importance to a company than a planned building program. It does much to shape the future. It's a large investment. It demands the best thinking of architects, engineers, management, and builder.

Success depends ultimately upon the builder—upon his ability to work with this building team from the inception of the idea, to translate blueprints into sound construction, on schedule, and at the lowest possible cost. His men and methods can make the difference between long-term profit and loss for owners.

For over 70 years the George A. Fuller Company has accepted this responsibility, building throughout the U. S. and in many foreign countries. Fuller has handled nearly every type of large construction project—ranging from the first steel skyscrapers to the newest milestones of architectural progress.

A host of completed buildings—and the companies for which they were built—are Fuller's best references. Your inquiries will be welcome.

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Work was simplified and savings made possible when the Stanley Steel Strapping System was used at The Bassick Company's South Plant, Bridgeport, Conn.

Casters formerly packed in unwieldly barrels now are packed in lightweight cartons, quickly stored by sizes. On shipment, orders are filled faster, cars or trucks loaded easier. Maximum protection in transit is provided. Bassick distributors save time and money in storing and reshipping to their customers.

In almost every type of plant — with almost every type of product — substantial savings are being made in packaging and handling by the Stanley Steel Strapping System. Call in the Stanley Packing and Shipping Engineer. He'll install the Stanley Steel Strapping System on a 30-day trial. No obligation . . . mail coupon.

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***A MAN** thoroughly experienced in steel strapping applications — the Stanley Packing and Shipping Engineer.*

A METHOD adaptable to any requirement — the Stanley Steel Strapping System with representatives in 32 principal cities.

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☐ Yes — the 30-day trial interests me. Have the Stanley Packing and Shipping Engineer call.

☐ Send full information on Stanley Steel Strapping System.

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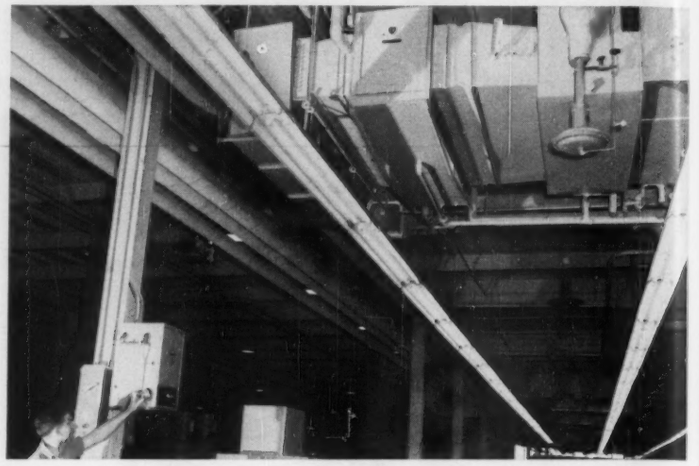
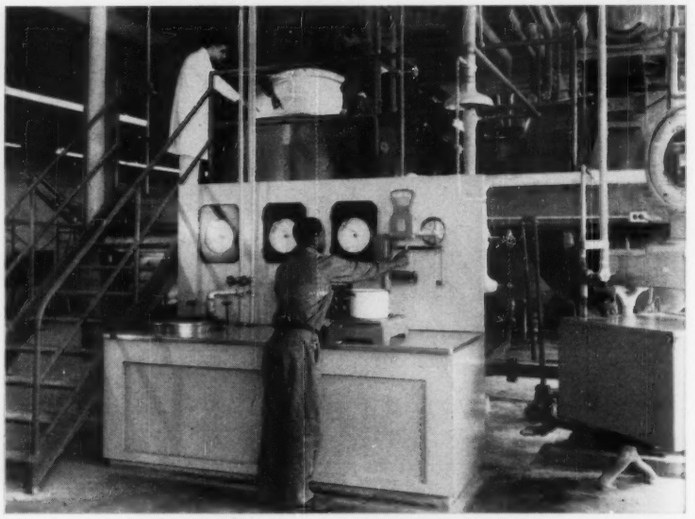
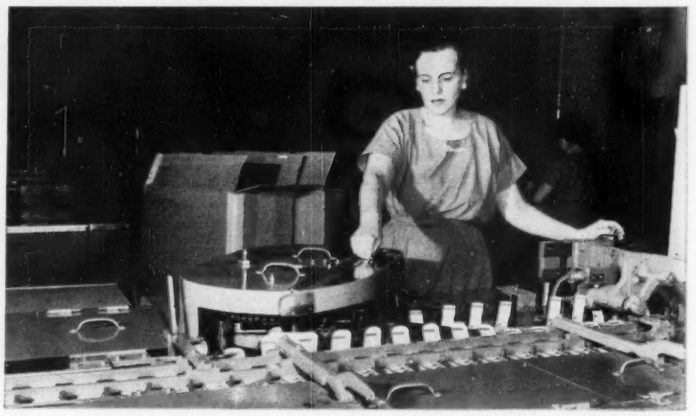


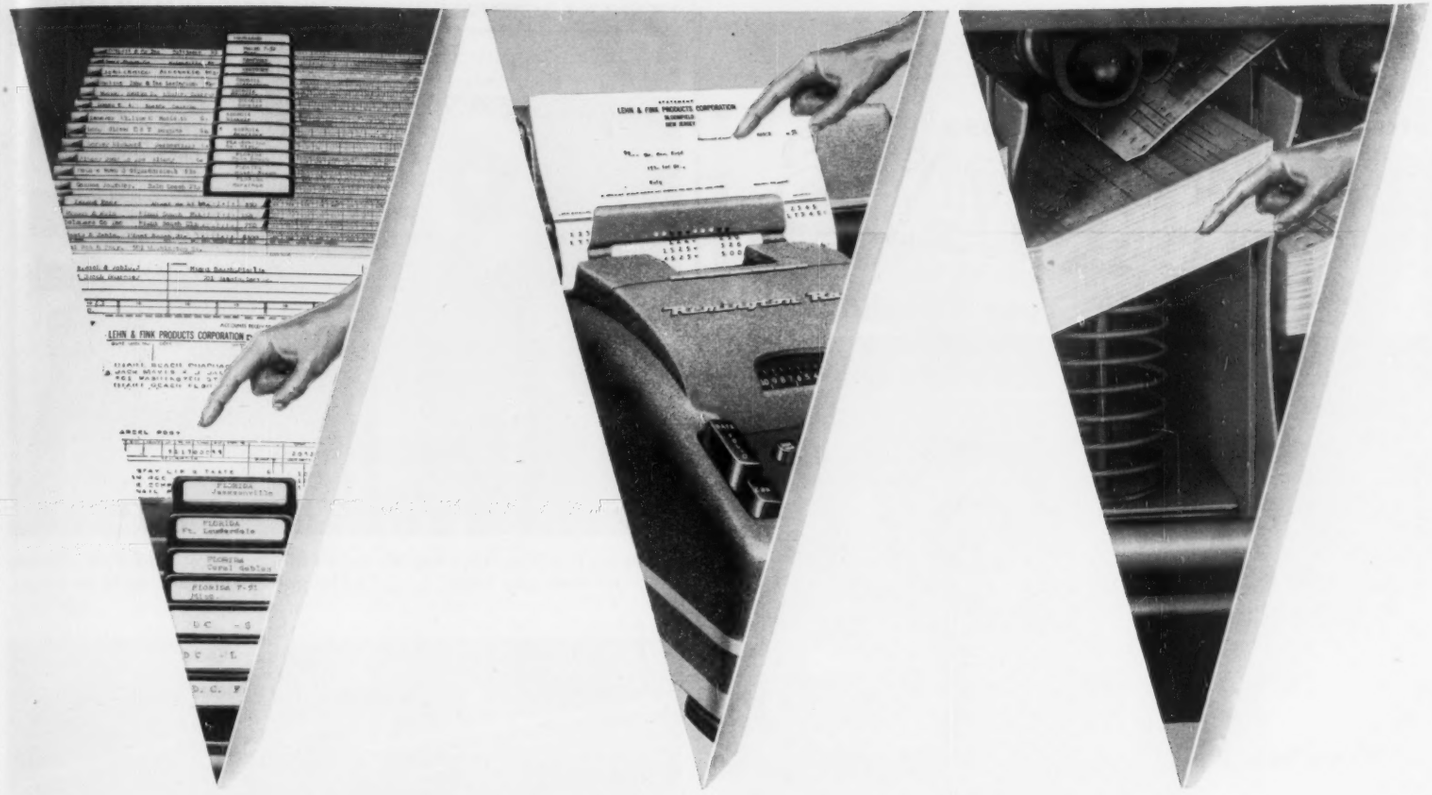
Cleaning the air cleaner—which is overhead—is a cinch. Maintenance worker simply operates cleaning mechanism from box at left.



Emergency shower, above and to right of control panel in shave-cream operation, is typical of many in both the laboratory and plant.



Extra safe: This machine on packaging line had normal safeguard. But glass panel, to let eyes see in, keep fingers out, was added.



These 3 IDEAS from Remington Rand

Cure growing pains – save $55,000 a year

Here's how a *team* of record-keeping methods can handle bigger and bigger work loads – smoothly – and save time and dollars too!

Three Remington Rand ideas did just that for Lehn & Fink Products Corporation. In a period of great expansion, they applied fast, automatic Remington Rand punched-card methods to customer billing, sales analysis and accounts payable – and released over 40% of their clerical staff on those operations for other work. They adopted visible, ledgerless bookkeeping (our SUIAP or Simplified Unit Invoice Accounting Plan) to control credit and collections – and cut clerical time in that department almost in half, virtually eliminated overtime and sudden work peaks. They switched to Remington Rand wide-carriage Adding Machines to prepare statements of accounts past due – a simplification that saved both time and money.

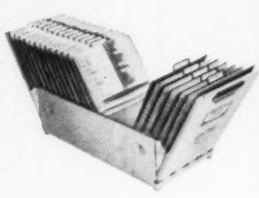
These three profit-building ideas show clearly why the Remington Rand sales engineer is so well equipped to do the best job for *you*. After he gets all the facts about your problem, he is free to recommend whatever is needed. Because he can offer a visible method . . . a machine method . . . a punched-card method . . . a photographic method . . . an electronic method . . . or a combination of methods to get the *results* you need. Feel free to call him on any kind of management problem.

Remington Rand INC

PROFIT-BUILDING **IDEAS** FOR BUSINESS

GOOD EXAMPLE FOR MANUFACTURERS

Certified Report #904 shows you how Lehn & Fink Products Corporation combines punched-card machines, wide-carriage Adding Machines and SUIAP to get faster, more efficient accounting and statistical reporting. For your free copy, call Remington Rand in your city or write to Management Controls Reference Library, Room 2984, 315 Fourth Ave., New York 10, N.Y.



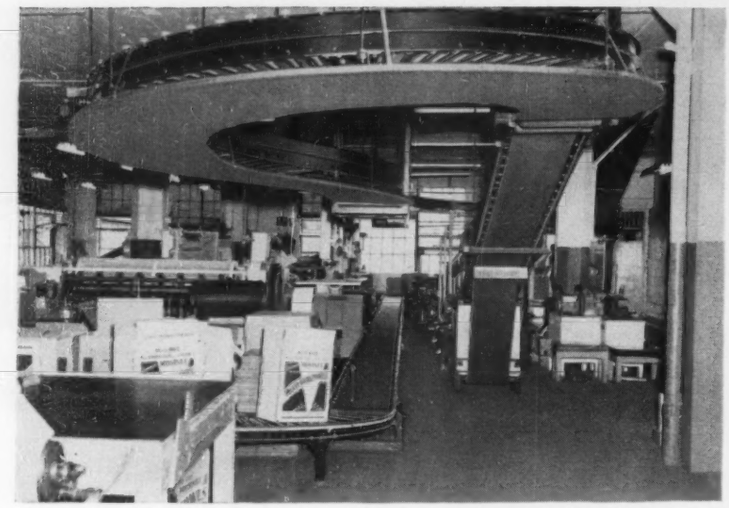
SUIAP

Wide-Carriage Adding Machine

Electronic Sorter

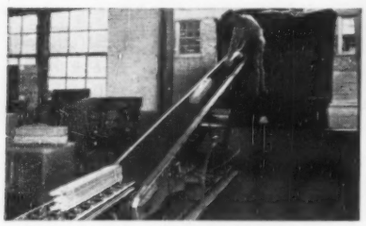
Start With Any One of These

FOUR WAYS To Cut Your Handling Costs



1 WITH ROLLER OR BELT CONVEYORS

— Wherever packages, parts, or units have to be handled — do it faster, better, cheaper, with Standard roller or belt conveyors, power or gravity. Standard also builds slat, chain, wheel, or pushbar conveyors to fit your needs.



2 with a HANDIBELT

— a small, light, compact, easily portable and maneuverable conveyor unit that stacks, loads, unloads cases, cartons, packages up to 135 lbs. in weight. Can be used inclined, declined or horizontal. Electric motor operated.

3 with SPIRAL CHUTES

— effective time, work and money savers lowering pieces, parts, packages floor to floor. Scientifically designed and properly pitched—available in many types and sizes. Cost nothing to operate.

4 with PNEUMATIC TUBE SYSTEMS

— provide swift, sure, safe transportation of messages, documents, blueprints, samples, small parts, money; cylindrical or oval tubes 1½ inch upward with dispatching and receiving terminals for complete systems to meet your needs. Write for special bulletin SPT.

Write for Standard's general Catalog MI-83. Tell us what you want to handle or name equipment on which you want more information.

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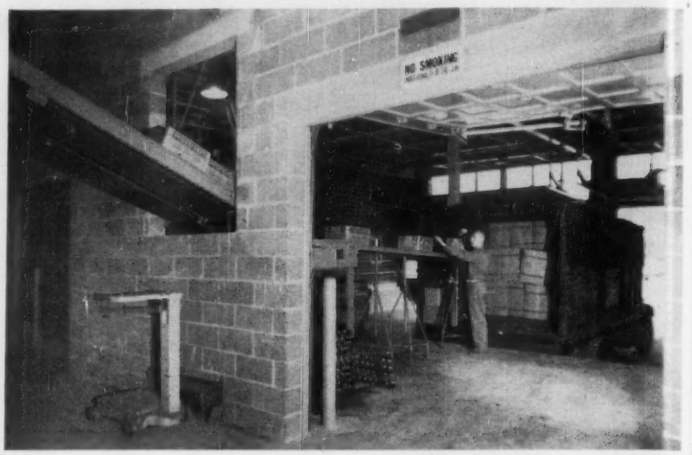
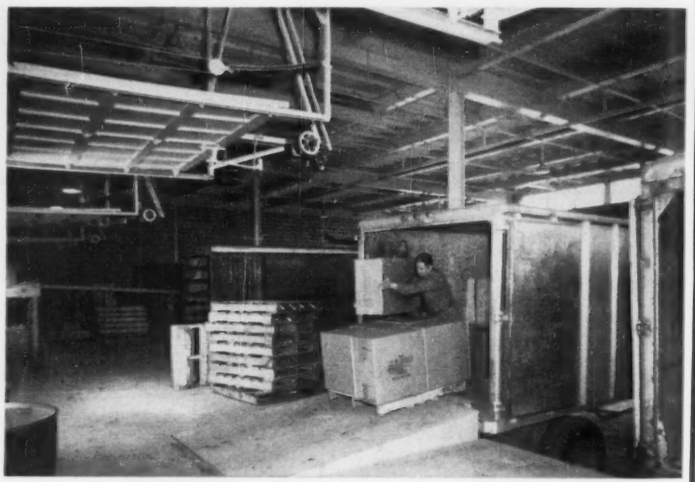
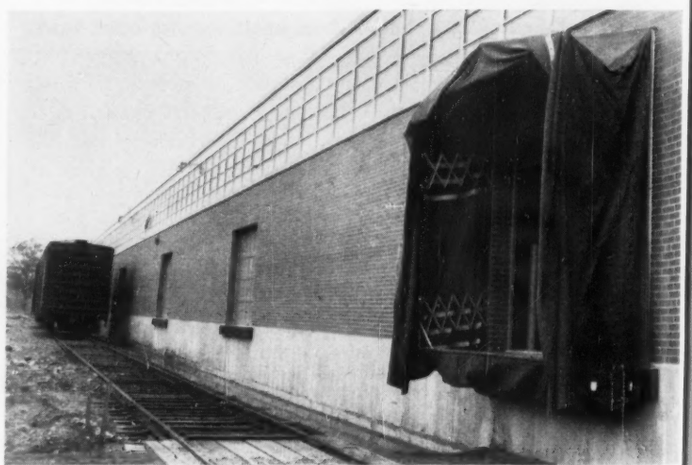


Materials handling matches Mennen's modern face. Conveyor starting in order make-up room (page 135) goes overhead; ends at trucks.



Hydraulic dock raises or lowers floor to level of truck backboard. Conveyor (top photograph) can be adjusted to load two trucks.



Bad-weather canvas covering protects workers at this loading, unloading spot for freight cars. Trucks also can use area for loading.

PREPAREDNESS

Continued from page 41

cisely assessed. That there was delay, and that there were significant production losses as a result of emergency action to protect critical military orders, is demonstrated by the hundreds of requests for expediting assistance that had to be serviced by the National Production Authority.

It is precisely the presence or absence of the necessary facts on requirements that determines the timetable governing the introduction of emergency controls over production and distribution. Under the procedures of the Controlled Materials Plan military prime contractors present statements of time-phased material requirements to carry out their assigned production schedules. They include in their presentation the material requirements of their suppliers of non-standard fabricated parts as a part of their complete report.

Manufacturers of civilian-type end-products (tractors, earth-moving equipment, metalworking machinery) and common-use components (motors, bearings, valves) similarly aggregate their own requirements with the needs of their suppliers of non-standard fabricated parts and submit them to the appropriate divisions of a civilian mobilization agency (the National Production Authority in the past two years, the War Production Board in the Second World War). In order to do this, manufacturers must determine their own procurement requirements with appropriate lead times, must canvass their suppliers' requirements (which may, on occasion, require a search for material information through several levels of suppliers down to manufacturers of bits and pieces), and must aggregate and submit consolidated requirements to the appropriate agency.

The Government's civilian mobilization agency is responsible for (1) amassing total requirements for all production and construction—military, defense-supporting, civilian, and export; (2) comparing total requirements with anticipated supplies (in terms of specific shapes and forms of controlled materials wherever production bottlenecks threaten); and (3) making program decisions that effect a distri-

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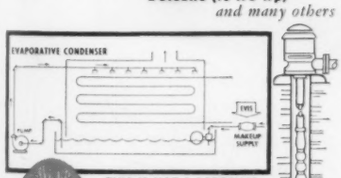
Write for further information or ask your Plumbing Supply, Air-Conditioning-Refrigeration or Industrial Equipment Jobber.



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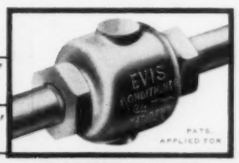

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HERE'S good news for everyone who uses sound or silent 16mm. films . . . a complete line of 16mm. Kodak Projectors that gives you a wide choice in meeting *your* specific needs!

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For showing sound or silent movies—or both—in small rooms or in spacious auditoriums . . . there's a Kodak Projector *exactly* right for your requirements.

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Kodascope Pageant Sound Projector, Model 1. Top choice for sound-and-silent projection under average conditions. For extra sound distribution, plug in the Kodak Multi-Speaker Unit—3 extra speakers in matching case. (Available also for use with other Kodascope Sound Projectors listed.) Projector, complete with 8-inch speaker, $400. Multi-Speaker Unit, $92.50. *Sound and silent projection.*

Kodascope Pageant Sound Projector, Model AV-071, with Plus-40 Shutter. Super-brilliant version of Pageant Projector, Model 1. Plus-40 Shutter increases light by more than 40%. Ideal for hard-to-darken rooms or auditoriums; for long screen throws or unusually large picture areas. $400. *Sound projection only.*

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Kodascope Pageant Sound Projector, Model AV-151E, with Plus-40 Shutter and 15-watt amplifier. Combines the extra light from Kodak's Plus-40 Shutter with the precise tone-and-volume features of the Model AV-151. Enables you to meet *every* 16mm. sound requirement short of a theater-type installation. $530. *Sound projection only.*

Kodascope Analyst Projector. Designed for 16mm. motion-picture analysis. Heavy-duty reversing mechanism operates from remote-control switch. Constant-speed blower permits repeated film reversals safely. Includes Kodak Daylight Projection Viewer for desk-top movie study. $295. *Silent projection only.*

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bution of the available supplies in accordance with a rational plan for achieving defense objectives.

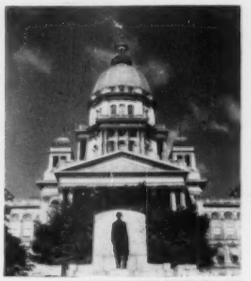
These decisions must, in turn, be translated into specific procurement authority assigned to individual military prime contractors and manufacturers of civilian-type products. This authority is then re-allotted to suppliers of fabricated parts and ultimately appears as purchase orders on metal mills. To permit reasonably efficient scheduling of mill operations, purchase orders must be placed from 45 to 90 days in advance of delivery months.

Time Required

If one considers the full implications of this procedure, from first preparation of requirements statements by manufacturers to actual rolling of metal shapes and forms in response to authorized orders, it is clear that a period of from six to nine months is involved even under favorable conditions.

This period is further extended if it starts without knowledge in industry and Government of the quantities and schedules of materials and components required to support specific levels of deliveries of finished products. This knowledge can be secured only from an established industrial record-keeping system that maintains a running account of material consumption related to product output. Formal bills of materials are not an effective substitute for facts drawn from current records.

On the assumption that the world



MONKMEYER PHOTOGRAPH

temperature remains substantially unchanged in the period ahead, and that in the interests of national security Congress renews the mobilization legislation to permit readiness and stand-by measures, the following control situation will prevail. The Controlled Materials Plan, with its system of quarterly application and allotment, will have been

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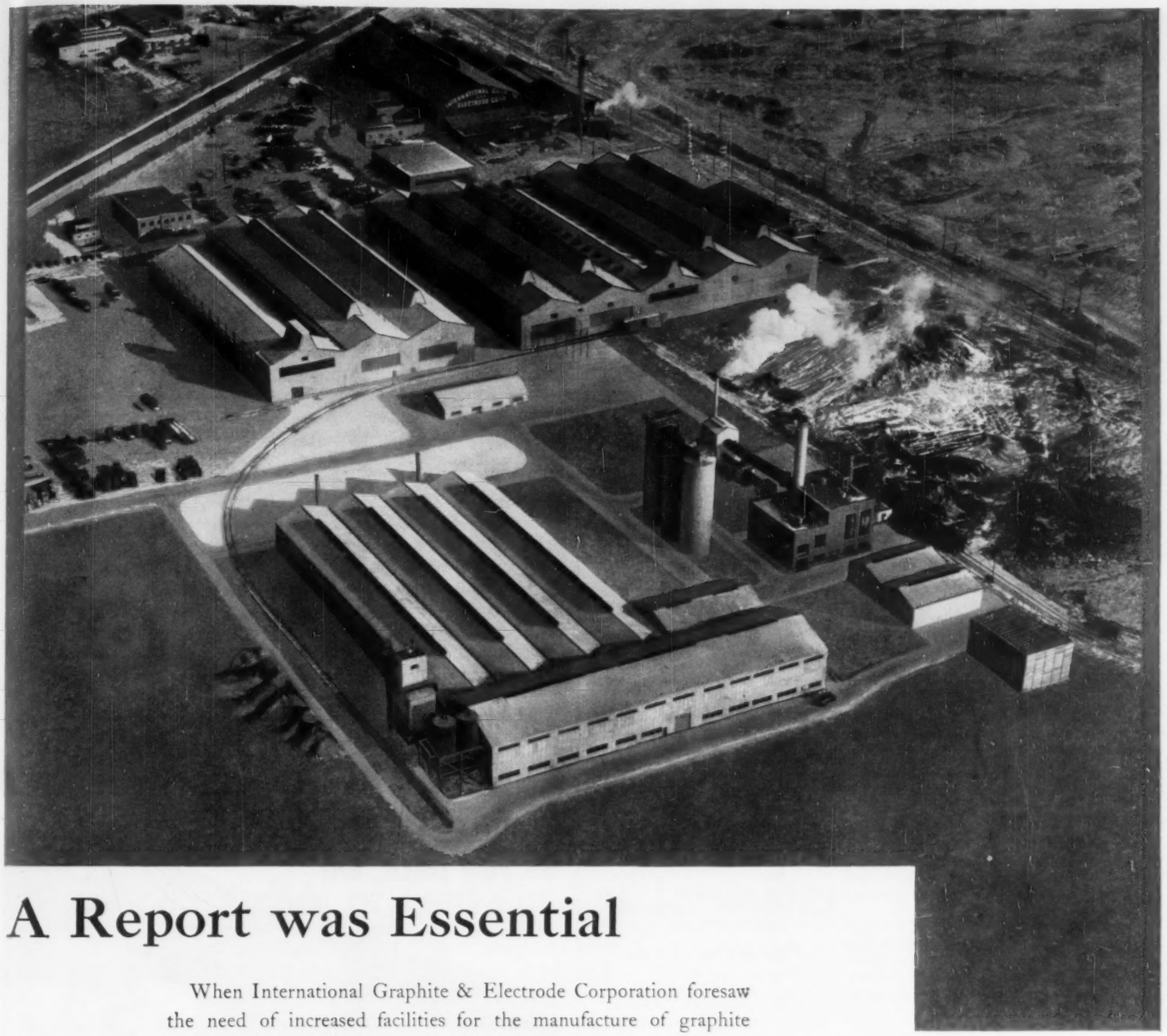

International Graphite & Electrode Division, Speer Carbon Company, Niagara Falls, N. Y.

A Report was Essential

When International Graphite & Electrode Corporation foresaw the need of increased facilities for the manufacture of graphite electrodes, Stone & Webster Engineering Corporation was asked to make a report and recommendations.

The report included a process study, a geographical analysis of product distribution, and a plant site survey which considered both economical distribution and the availability of power and skilled labor.

When, in accordance with the recommendations, International Graphite decided to add extensive new facilities to its Niagara Falls plant, Stone & Webster Engineering Corporation was employed to design and build them.

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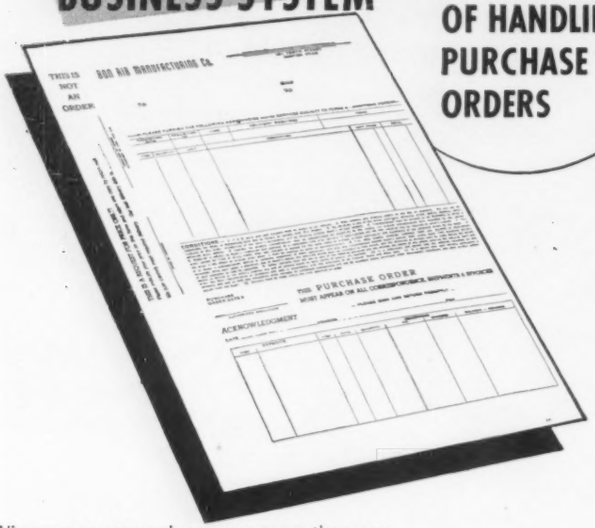

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abandoned for all production and construction except direct military and atomic energy programs. A modified control system will be continued in these areas to protect the preferred status of military programs, to assure the maintenance of procedures and nucleus organizations in the military agencies, and to protect other material users from unnecessary dislocations resulting from unrestricted military procurement.

Control and Decontrol

Space for military orders will be reserved by the metal mills to spread the load and avoid geographic, price, and transportation dislocations in military procurement. All other production and construction will be uncontrolled, except for the use of a few materials, such as nickel, which are expected to remain in critically short supply for some time and which are of major importance for the accomplishment of military schedules.

The abandonment of the over-all Controlled Materials Plan will mean, of course, the end of reporting by industry of the data on product shipments and material requirements that are called for on CMP application forms. In the normal course of events, most manufacturing concerns will stop CMP recordkeeping.

At this stage, beginning in the second half of 1953 and extending into the indefinite future, what assessment should be made of our mobilization readiness?

The essential elements of a state of mobilization readiness can be defined as products of our mobilization experience—successes and failures—in World War II and in the past two years:

1. Military forces, including those maintained by our allies, strong enough to withstand a first attack, adequately armed, and backed by weapons reserves.

2. Detailed and current translations of full mobilization requirements for direct military, defense-supporting, and essential civilian and export programs. Requirements translations should extend to metal shape and form detail, should encompass the materials and fabricated components for which supply limitations may arise, and should include full projections of conservation and substitution potentials that

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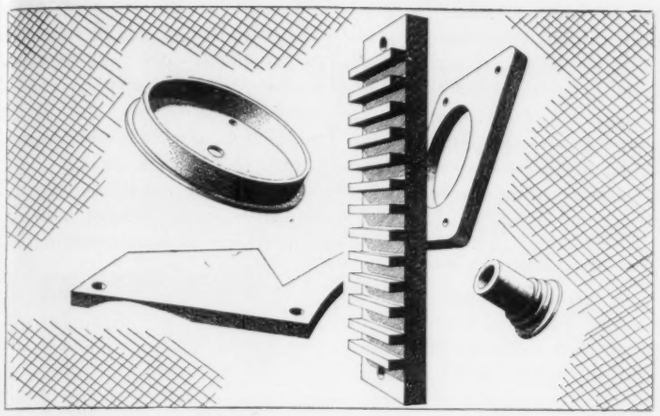
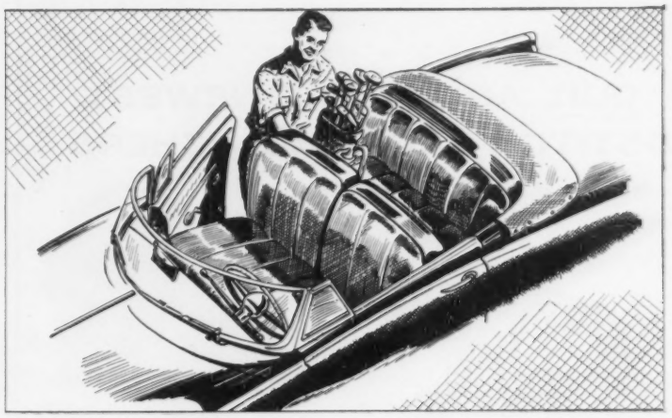
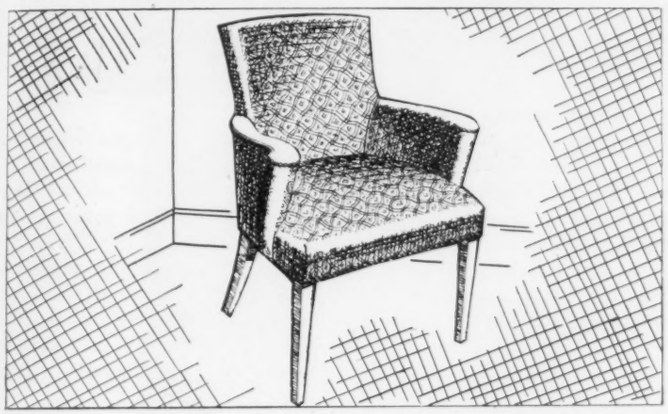


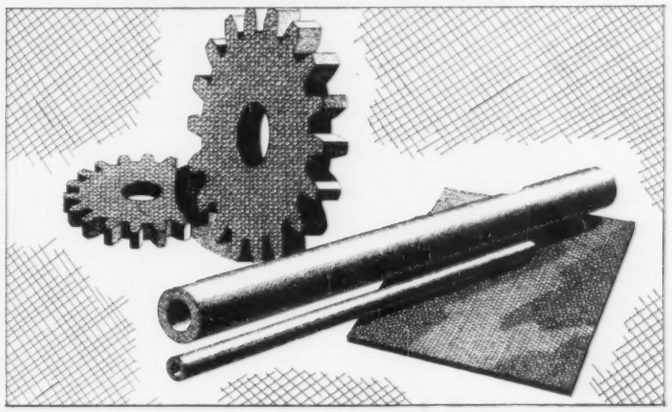
Wellington Sears spun nylon fabric reinforcement contributes superior bonding strength and insulating qualities to laminated electrical parts.



Especially suited to automobile upholstery, Wellington Sears sateens are a preferred backing for smooth, tough, good looking coated materials.



Columbus sheeting, long known for outstanding quality, is a versatile backing fabric widely used for many coating applications such as upholstery.



Wellington Sears duck fabric reinforcement ensures high impact strength in many laminates—heavy duty gears, tubes, sheet stock.

Standard and "Fiber-Engineered" Fabrics For All Types of Coatings and Laminates

The extremely rapid growth of the plastics industry . . . the ever-widening application of its laminated and coated products . . . have called for newer and better fabric fillers and reinforcements. As prime supplier of textiles for all industrial uses, Wellington Sears offers an extensive line of standard and special or "fiber-engineered" fabrics tailor-made for plastic processing. Many of these special constructions utilize the unique properties of the newer man-made fibers.

Wellington Sears coating fabrics range from heavy backing cloths—such as sateens, twills and broken twills, enameling ducks—to lighter weight Columbus sheeting, drills, spun and filament synthetics and resin-bonded Lantuck non-woven fabric. The demands of laminators for fabrics which will improve shock resistance, add impact strength, provide insulation or ballistic properties, are met by a similar line of uniformly high quality constructions—in a variety of widths and weights.

Whatever the end use . . . for industrial, consumer or military applications . . . there's a standard or "fiber-engineered" Wellington Sears fabric to solve your problem efficiently, economically—and with a minimum of production headaches. Let's talk it over.

Wellington Sears has prepared an illustrated 24-page booklet filled with valuable facts on fabric development and applications which will be of interest to present and potential users of industrial fabrics. Write for a free copy of "Modern Textiles For Industry" to Wellington Sears Co., Dept. 1F, 65 Worth Street, New York 13.

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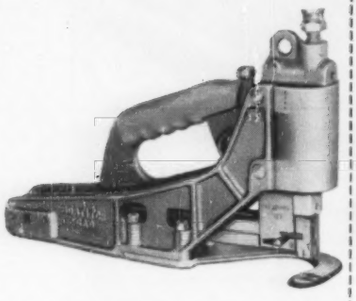
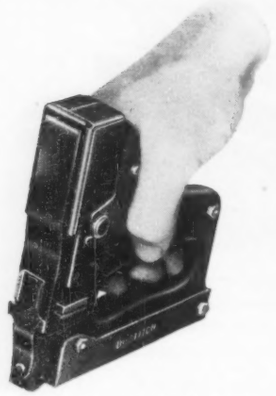
A QUIZ ABOUT THE NEWEST BOSTITCH PROFIT-CLINCHERS



1 How can a squeeze of your finger seal overlapping flaps of tough fiber containers?

2 What is the newest, surest, quickest, cheapest method of sealing small shipping containers?



3 How can you clinch staples in soft materials without a blade or clincher under the work?

ANSWERS:

1 This powerful new Bostitch Air Drive Stapler with "C" blade—Model C67AD—is ideal for the job. Drives heavy-duty staples through tough materials, easily and rapidly. It's a whiz with large, awkwardly shaped containers!

2 Stapling, of course, with the handy new Bostitch P6P Stapling Plier. Its pointed blade makes only a tiny slit to insert the clincher for stapling flaps of small corrugated containers, and lids of all sizes.

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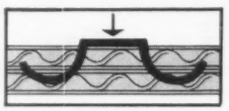

The Bostitch Line includes more than 800 profit-clinching machines—one to fit almost any fastening need. Staplers for production lines, shipping rooms, offices. Let your local Bostitch man demonstrate them to you. He's under "Bostitch" in your telephone directory.

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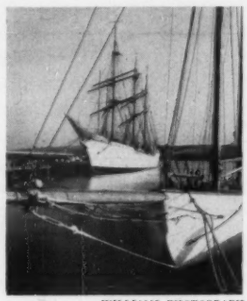
may be instituted when the need arises. Finally, requirements information should be constantly revised to reflect strategic considerations, the evolution of weapons, and the changing character of defense-supporting ties to military needs (as, for example, in the case of aviation gasoline and jet fuel).

Mobilization Base

3. A carefully planned mobilization base of material resources, and military and industrial production facilities (together with supporting facilities of power, petroleum, transportation, and so on), in current use or standby condition. The elements of the mobilization base should be fully explored in terms of known mobilization requirements. While private industry should be given encouragement and assistance in undertaking the necessary expansions to complete the mobilization base (by tax amortization, long-term purchase contracts, loans, premium payments, and other devices), some of the requirements will be of such a nature as to call for Government sponsorship.

4. Fully-developed production control procedures ready for prompt installation in the event of need. The procedures should be subjected to periodic dry-run tests in Government and industry to expose operating weaknesses and to familiarize Government and business personnel with their details.

5. Industrial record-keeping designed to provide current information on material consumption re-



WILLIAMS PHOTOGRAPH

lated to product output, organized to fit without major adaptation into allocation and other control procedures that will be instituted in the event of war.

6. Skeleton operating organizations in the military services and in a permanent civilian defense agency that will serve as a nucleus around which expansion can take

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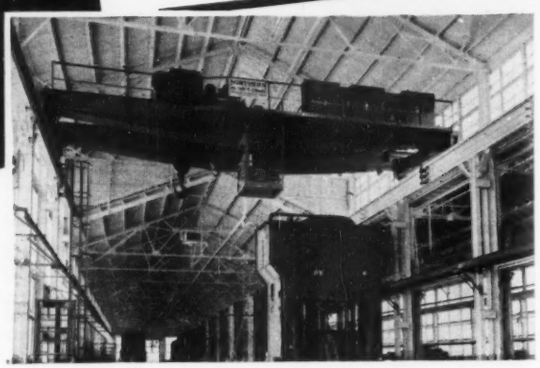
. . . for moving production machinery rapidly . . .



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Guard castings (SAE 1045) for the blades on this mowing machine are sheared at these 6 places simultaneously. Steel die sheared only 12,000 castings, then needed sharpening. Die wearproofed with tungsten carbide—a Carboloy created-metal—shears over 100,000 before resharpening.

Ultra-hard metal extends die life 800%...cuts costs

A steel die, used by the Oliver Corporation to shear heavy castings, once dulled and needed sharpening after 1 day's output. Then, small inserts of Carboloy cemented tungsten carbide—*hardest metal made by man*—were brazed onto the die's cutting edges.

Things happened! The die stayed sharp for 8 days. Output between sharpenings jumped from 12,000 pieces to 100,000 pieces. Costs were trimmed, too, because of less downtime, fewer rejects, fewer manhours needed for grinding and maintenance.

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Cemented tungsten carbide is only one of the Carboloy created-metals you might use to advantage.

Perhaps you can apply new Chrome Carbide, for example, to combat corrosion, along with erosion and abrasion in equipment parts. Or Carboloy permanent magnets to improve your product's design, lower its size, weight, cost. Or Hevimet to build a better balance weight or radiation screen.

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place in some sudden emergency.

7. A trained corps of "reservists" in industry, the universities, and the regular Government departments prepared for assignment to mobilization administration tasks in wartime, and thoroughly informed on new developments and procedures through periodic refresher courses and short-term assignments to work with the military and civilian nucleus defense staffs.

Steps Taken

The present mobilization program has made provision for some of these elements. Together with our allies we are building military forces trained and equipped to meet an attack and strike back. We have extended the mobilization base, although with insufficient knowledge of requirements. And we have added to our material resources at such a rate that comprehensive distribution controls have been abandoned. We have gross aggregate estimates of full mobilization requirements, helpful for over-all planning, although not useful for identifying many specific weaknesses in the mobilization base.

As long as military production continues to be administered under a system of positive control, a nucleus operating and procedural group will be maintained in the Pentagon. Finally, industry's cooperation in sending picked executives to Washington for service with the National Production Authority, as well as with other mobilization agencies dealing with petroleum, power, transportation, and related defense-supporting areas, has built a large group of experienced men. It will be rela-

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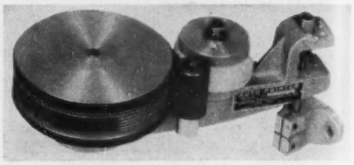

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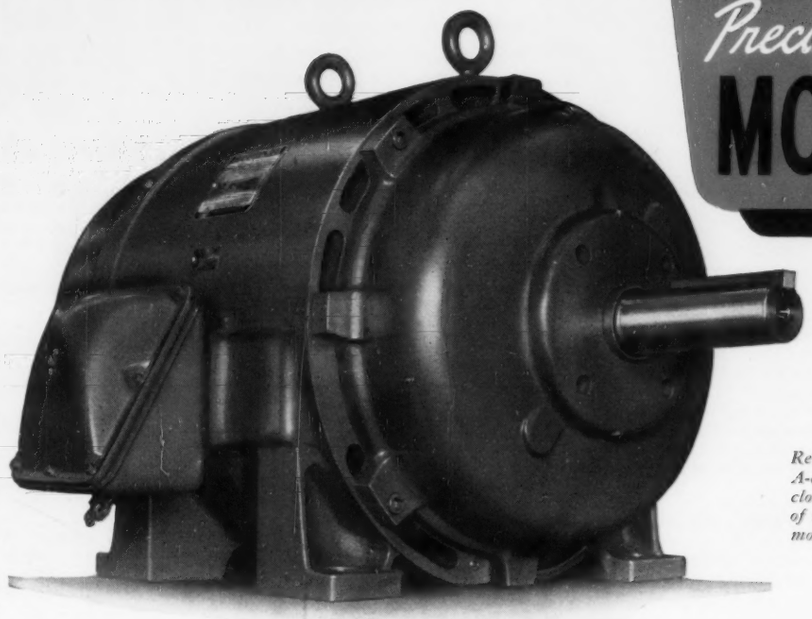
- *Are sales down*—in proportion to the time, effort and money expended?
- Do you have a new product of proven merit that is not winning the acceptance it deserves?
- Are sales increasing through the aggressive development of new markets and the expansion of existing ones?

Call or Write For Information
ROSSI and COMPANY
Guardian Building • Detroit 26, Mich.
ADVERTISING • MERCHANDISING

FOR RUGGED SERVICE...

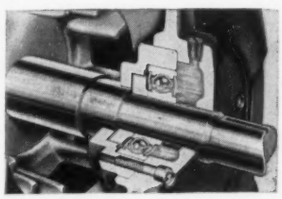
"All motors are NOT alike!"

RELIANCE *Precision-Built* **MOTORS**



Reliance Totally-enclosed Fan-cooled A-c. Motor. All other standard enclosures available, with wide choice of mechanical designs and special mountings. Ratings from 3/4 to 300 hp.

- ☆ Heavy shafts, bearing to bearing
- ☆ Indestructible pressure-cast rotors
- ☆ Shock-resistant frame and bearing-bracket construction

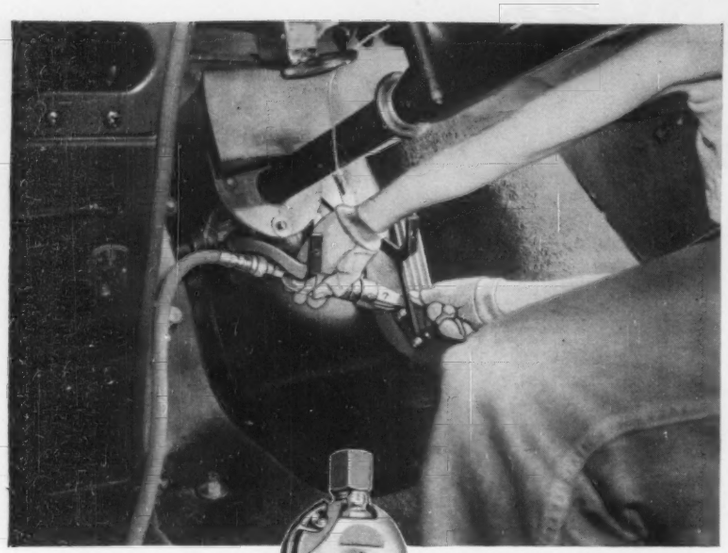


. . . AND THE BEST PRE-LUBRICATED BEARING DESIGN

The Reliance pre-lubricated bearing provides *four times more operating hours without re-lubrication* than any other bearing used in motors today. And—whatever your lubrication schedule—*you just can't grease'em wrong!* To get the complete "inside story" on motor bearings, write today for Bulletin B-2201. It contains hard facts on the advantages of the Reliance pre-lubricated bearing design, with cutaway view, cross-section diagram, comparison chart, and statements by bearing manufacturers. B-1458 J

RELIANCE ELECTRIC AND ENGINEERING CO.

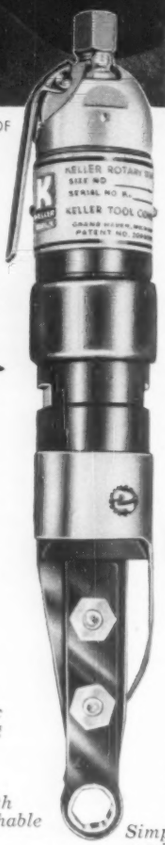
1066 Ivanhoe Road, Cleveland 10, Ohio • *Sales Representatives in Principal Cities*



ANOTHER EXAMPLE OF *KELLER Air Tools engineered to industry*

KELLER *Air Tools*

for tightening hard-to-reach nuts



Open-end design fits over hydraulic tubing and piping

Can be used with built-in or detachable sockets

Simple operating mechanism

Reduces operator fatigue

Light weight and balance

Reaches into close quarters

Some of the toughest jobs in industry suddenly become easy when Keller Ratchet Wrenches go to work. They are the *only* successful power ratchet wrenches ever devised (air OR electric), and they have eliminated some very tiresome jobs.

For instance, on the automobile assembly line shown above, where a Keller Ratchet Wrench is used for attaching the accelerator pedal.

Facts in Brief

about Keller Ratchet Wrenches

Send for literature and additional information on this unique POWER ratchet wrench

Keller Tool Company, Grand Haven, Mich.
Please send me additional information and specifications on the Keller Ratchet Wrench.

Name_____ Title_____

Company_____

Address_____

City_____ Zone___ State_____

tively simple to maintain lists of available personnel and to provide current information and refresher experience over the years ahead.

What Is Lacking

The deficiencies are in (1) the provision of current, reliable, and detailed information on full mobilization requirements; (2) the chinking-in of the mobilization base in resources and production facilities to remedy weaknesses in the light of new knowledge of detailed mobilization requirements; (3) establishing procedures for securing current information on production-use relationships; (4) to a considerable extent contributing to the preceding actions, the maintenance of production-use records by industry both as a source of current information and as a guarantee of industry's ability to make a rapid adaptation to the institution of controls if that step should become necessary; and (5) developing and testing control procedures that will serve as tools for carrying out determined mobilization policies with speed and effectiveness if the need should arise.

The AUTHOR

Melvin Anshen, Professor of Industrial Administration at the Carnegie Institute of Technology, has spent a large part of his life in academic surroundings, but Government experience has given him vast knowledge of the problems of industrial mobilization.

He received his AB from Harvard and went on to take an MBA at Harvard Business School and later a DCS at the same institute. While Professor of Marketing at Indiana University, he acted as consultant to many Government agencies and business concerns.

From 1942 to 1946, Professor Anshen served in various capacities on the War Production Board ending as Director of the Research Staff. In 1951 he returned to Government circles to serve as Acting Deputy Administrator for Program and Requirements in the Defense Production Administration.

The critical weakness is that, in the absence of industrial records maintained in operating condition and keyed to the requirements of control procedures—or, conversely, in the absence of a control system geared to normal industrial record-keeping practises—the installation of controls in an emergency cannot fail to be perilously slow, with dangerous waste of resources in the installation period.

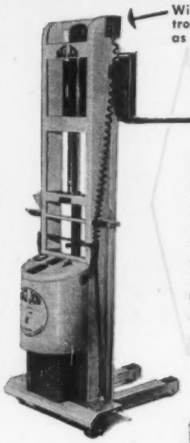
Write for DEMONSTRATION

in your plant. See how bulkier loads can be handled with even greater ease and safety by using

NEW!

BIG JOE

Hydraulic Lifts



With optional remote control operator can use lift as portable elevator.

BATTERY OPERATED UNITS

Straddle-type base in range of widths; adjustable forks in range of lengths. Swivel casters at rear facilitate maximum maneuverability. Push-button control. Dual ground gripping brakes. Semi girder-type frame trims off dead weight. Capacity 1000 lbs.; lifting hts. to 80". Priced from **$672.50**

(Other Models from $587.50)

STEP-ON-IT UNITS

All features of construction same as unit above but equipped with "Step-On-It" pedal control. Units can be furnished with forks or platform as illustrated. Capacity 750 lbs.; lifting heights to 68". Prices from **$281.50**

(Other Models from $236.50)

Illustrated models are additions to the regular Big Joe line to afford a broader selection of lifts in meeting specific materials handling needs.

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Distributors in Principal Cities

BIG JOE MANUFACTURING COMPANY

912 W. Jackson Blvd., Chicago 7, Ill.

Cable Address: Big Joe

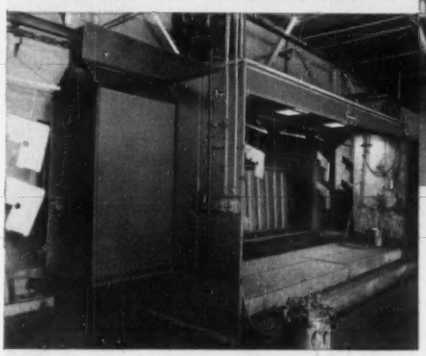
*T. M. Reg. in U. S. Pat. Off.

COMPLETE *Finishing* SYSTEMS

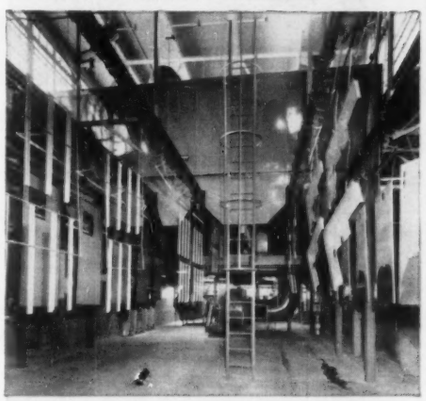
. . . for ENAMELS • LACQUER • PAINT • VARNISH

Exit end of Mahon Two-Conveyor-Line Metal Cleaning and Rust Proofing Machine at American-Standard, Buffalo, N. Y.

Entrance end of Mahon Metal Cleaning and Rust Proofing Machine with two parallel conveyor lines. Note combined Dry-Off and Finish Baking Oven overhead at right.



One of four Mahon Conventional Type Hydro-Filter Spray Booths with "Hydaire" Flood Sheet—part of the Complete Mahon Finishing System at American-Standard.



Mahon Overhead, Bottom Entrance, Combined Dry-Off and Finish Baking Oven at American-Standard. Dry-Off section is at the right. Temperature Control is Automatic.

American-Standard Products Receive Their Fine Finish in Mahon Equipment!

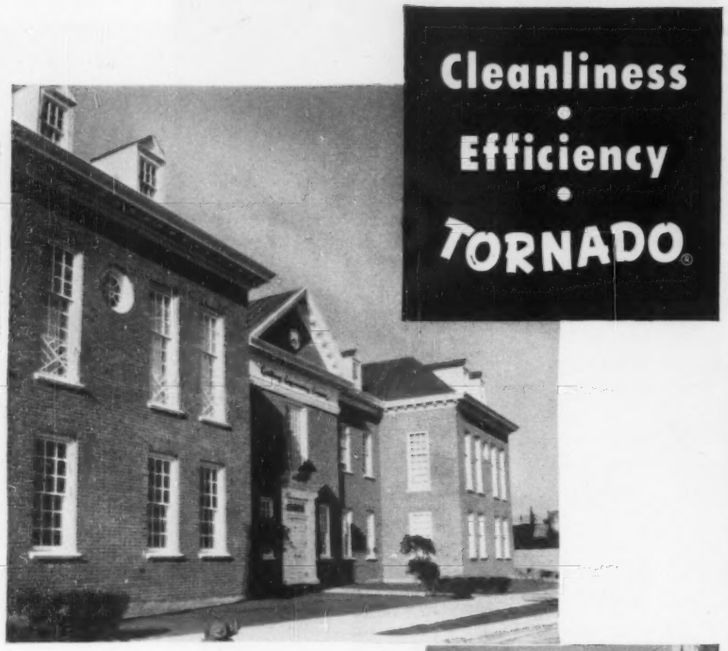
Illustrated here are major elements of one of two Complete Finishing Systems recently installed by Mahon in the Buffalo Stamping Plant of American-Standard. In this particular system, which is ultramodern in every respect, jackets and other metal parts of residential heating and cooling units are carried through the entire system on two parallel conveyor lines. Metal Cleaning and Rust Proofing is accomplished on the two conveyor lines in a single processing tunnel. The two parallel conveyor lines then carry parts through an overhead bottom entrance, single-pass Dry-Off Oven which is an integral part of the Finish Baking Oven. Parts on each of the conveyor lines then pass through two conventional type Hydro-Filter Spray Booths, staggered right and left hand, where the finish is applied. Finish is baked while the two parallel conveyors make a double pass circuit in the finish baking section of the overhead oven. This is a typical Mahon engineered Finishing System. If you are contemplating new finishing equipment, you too, will find that Mahon engineers are better qualified to do the all-important planning and engineering which is the key to fine finishes at minimum cost . . . and you will also find Mahon equipment more economical to operate over a longer period of time. See Mahon's Insert in Sweet's Plant Engineering File for further information, or write for Catalog A-653.

THE R. C. MAHON COMPANY

HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning and Pickling Equipment, Metal Cleaning and Rust Proofing Equipment, Hydro-Filter Spray Booths, Filtered Air Supply Systems, and Drying and Baking Ovens; Core Ovens, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other units of Special Production Equipment.

MAHON



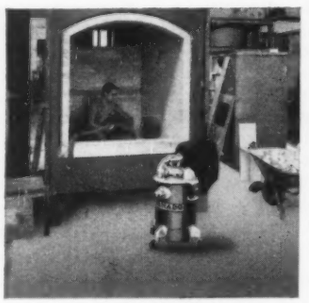
Did you ever see a manufacturing plant that looks like a colonial mansion? That's the Lindberg Engineering Co. in Chicago where even the window grills are authentic copies from Jefferson's Monticello. Inside, you would see that pride in appearance is carried out in pride of workmanship. Spotless housekeeping creates an atmosphere where people want to be businesslike and efficient.

Lindberg uses Tornado floor machines in the office to simplify daily cleaning and in the shop to vacuum refractory and insulation dust from the heat treating furnaces they manufacture.

You'll find that plants using Tornado do a good job of housekeeping as well as a bang-up job of manufacturing. We think this is more than a coincidence, because a well kept plant is an efficient plant. Why don't you find out more about Tornado plant cleaning equipment?

Write for Bulletin 600

Tornado makes light work of cleaning the entrance lobby at Lindberg Engineering Co.



Tornado speeds cleaning of refractory and insulation dust during production of this Lindberg heat treating furnace.

BREUER ELECTRIC MFG. CO.

5106 N. RAVENSWOOD AVENUE • CHICAGO 40, ILLINOIS

A program to remove these deficiencies and weaknesses in the nation's state of mobilization readiness will require extensive and creative co-operation between industry and government. If the price of maintaining a fully prepared economy were the establishment of a garrison state in which private business must sacrifice much of its freedom of decision in using materials and selecting customers, the cost of security might well be judged prohibitive. Some lower level of safety with its accompanying higher risk would be preferable.

Security and Freedom

A large measure of security in the form of mobilization readiness is not incompatible with free enterprise, however, if industry and Government jointly plan the resolution of the practical problems involved. This will require an unfamiliar concentration of attention on methods and procedures and their essential foundation in information and industrial records, and a diminution of unprofitable preoccupation with policies and programs.

In this, the first part of a two-part article discussing the problems and lessons learned in our past experience and our future outlook toward

NOY PHOTOGRAPH

defense mobilization, the author has defined and described the background against which industry and Government must operate. The concluding part of "The Case for Mobilization Preparedness" *will appear in the September issue of* DUN'S REVIEW AND MODERN INDUSTRY. *In this the author presents his views toward the development of adequate solutions to many of the problems we now face.*

The heavier the load, the tighter the joint

★ NO SAG
★ NO SWAY
★ NO BUCKLING

THE WORLD'S STRONGEST SHELVING

BERGER Wedge-Lock Steel Shelving

A BERGER-PATENTED FEATURE

Write for descriptive literature

BERGER MANUFACTURING DIVISION
REPUBLIC STEEL CORPORATION
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REPUBLIC STEEL

EMPLOYER RELATIONS

Industrial relations director deprecates "souped-up" annual reports for employees. Useful study shows wages, benefits for big and little concerns.

"Comic book" reports hit as bad P.R.

Special, "simplified" annual reports for employees, some of which in recent years have had pop-up pictures, phonograph records, jig-saw puzzles, and moving parts as added gimmicks, are deplored by one Chicago director of industrial relations as bad practise.

He is Jack Staehle of Alden's, Inc., a mail order house, which sends employees the same annual report it sends stockholders.

"Every year," Staehle says, "one reads of the many special annual reports prepared for employees. From an industrial and public relations standpoint, I think this is bad for the following reasons:

"1. It implies that employees are less intelligent than stockholders.

"2. This thinking contradicts the advertisements, which show that many stockholders are employees.

"3. In my opinion, if the regular annual reports cannot be understood by the average individual (which includes stockholders and employees), then the correct procedure is to rewrite the reports so they *can* be understood."

The latest Alden's report, an attractively designed piece, reflects Staehle's convictions to the extent that many might think it too formal.

A good example of a report that popularizes without writing down, is the Pennsylvania Railroad's "preview" of its 1952 report in the May 1953 issue of its employee magazine, *The Pennsy*.

Area handbook of national value

Very model of an industrial relations data book is the new *Guide to Good Labor Relations* of the

Hat workers' air-conditioned lunch room

When hot weather hits the uplands around Sunbury, Pa., where Champ Hats, Inc., has its factory, air conditioning for the lunch room rolls down off the hills instead of out of a duct. Many employees can go home for lunch, but the rest eat on this dining terrace. The plant, strikeless since 1937, when it opened, shuts down the first day of the hunting season each year, and remains closed during half of the second day.

AUTOMATIC ELECTRIC COMPANY—A GREAT NAME IN COMMUNICATIONS

P-A-X makes good employees better!

P-A-X prunes man-hours from the payroll—cuts walking, waiting, confusion, delay—with a completely automatic telephone service entirely separate from the public telephones.

A P-A-X Business Telephone System makes good employees better! Dialing the office next door or the far end of your plant takes just seconds. Each P-A-X call saves time, steps, errors and energy.

Thousands of organizations have discovered that a P-A-X Business Telephone System quickly pays for itself in lower telephone bills—and savings from new operating efficiencies are almost limitless. Communications case studies have been prepared with the cooperation of P-A-X users. Write or call: Automatic Electric Sales Corporation (HAymarket 1-4300), 1033 West Van Buren Street, Chicago 7, Illinois.

PAX is a system of "inside" telephones, separate from the public telephones, and owned by the user.

PAX is completely automatic and establishes all "inside" calls, within seconds, at any time!

PAX saves on public telephones and switchboard—permits marked economies in rented equipment.

PAX is manufactured by the originator of the automatic telephone.

PAX telephones and switchboards are identical in quality with your public telephone equipment.

P-A-X business telephone systems
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Please send me more information:
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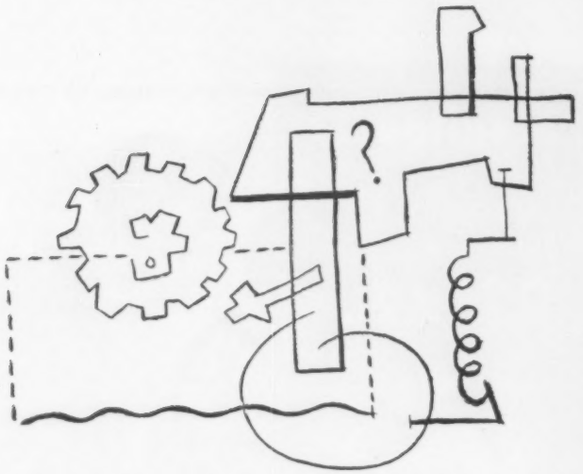
Address_____
City_____ State_____



If your new equipment is only a Doodle call in Proctor & Schwartz

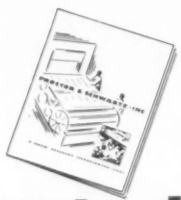
Developing doodles into time-saving, labor-saving, cost-cutting, profit-making, problem-licking processing equipment—is the business of Proctor & Schwartz, Inc.

Here, on Tabor Road in Philadelphia, is a unique background of 70 years of creative engineering experience. Here is a corps of inventive minds which has coped with—*and solved*—a diversity of modern industrial problems: from a method of processing whale meat at sea to a method of manufacturing mattress batting in a continuous automatic operation, beginning with the bale of raw cotton.

Proctor offers unusual laboratory and shop facilities for research, development and design. Proctor also provides complete fabrication, installation, and field engineering on start-up.

Do you have a doodle? Or do you have a processing problem so complex that even doodling a doodle has you stumped? In either case, we invite you to call in Proctor & Schwartz.

FOR YOUR INFORMATION AND FILES:
A brochure describing the services and facilities provided by Proctor & Schwartz, Inc. Write today. No obligation.



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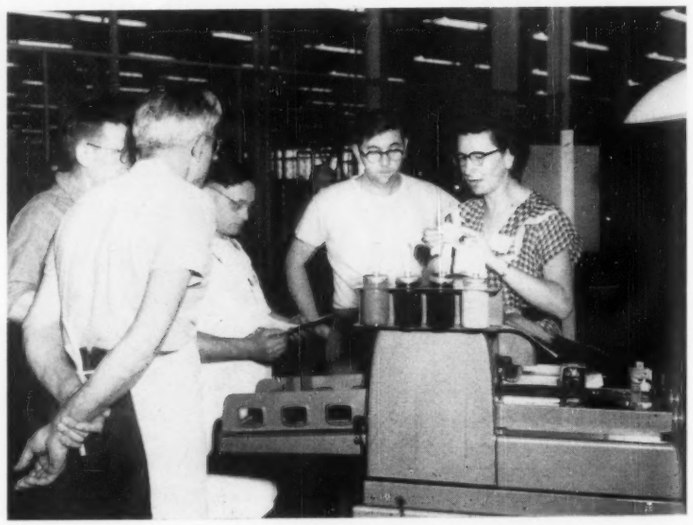
A COMPLETE ENGINEERING-MANUFACTURING FACILITY FOR HEAVY PROCESSING MACHINERY

continued

Associated Industries of Cleveland. Its multiple breakdowns of pay, working conditions, and fringe benefits data make the publication, this year's edition of an annual report, of considerable potential use to employers outside the Cleveland area.

Besides showing the prevalence of specific personnel practises in more than 300 plants with payrolls ranging from fewer than 50 to several thousands, the *Guide* gives additional breakdowns of the same data by size of company, by industry, and by the unions with which the companies have labor agreements.

Separate sections deal separately with factory and office personnel, and, where appropriate, there are separate data for male and female employees. Additionally, the *Guide*



Employee relations bonus from sales display

A colorful display of products and product uses which A. B. Dick Company of Chicago prepared for the National Office Management Association convention last Spring was converted into a personnel tool this Summer when it was set up in the plant for employees to visit during working hours. Specialized jobs, separation of manufacture of parts and supplies, keep many employees from full knowledge of the use of what they make. The show, a big employee success, gave their work meaning. Top: Part of the display, off an assembly line. Bottom: Multi-color duplicator at work for the men who make the tools and dies for it.

DOW

MAGNESIUM ADDS PORTABILITY TO BUSINESS MACHINE FEATURES

Salesmen can now carry dictating machines on the road because of strong, lightweight MAGNESIUM construction

Communications—that's the key to success in many progressive sales organizations across the country. How long does it take for a salesman to report to the home office? How accurate, how detailed is the sales report when it is received?

To speed up this contact and to improve its quality, some sales managers require their field representatives to make a daily report via portable dictating machines which salesmen can now take into the territory—thanks to strong, lightweight Magnesium construction.

Yes, Magnesium—the lightest of all structural metals (it's one third lighter than aluminum) allows manufacturers of business machines to produce equipment that is light enough for easy carrying, strong enough for rugged handling, and practical enough for day-in, day-out use.

Other manufacturers have capitalized on Magnesium's versatility. For instance, the aircraft industry has made liberal use of it to increase the speed, extend the range, and add to the load-carrying capacity of modern planes.

Have you considered Magnesium for your product? For the facts on this remarkable metal, write to THE DOW CHEMICAL COMPANY, Magnesium Department, Midland, Michigan.

you can depend on DOW MAGNESIUM

DOW

Immediate cash whether your business needs $25,000 or millions

Quick

COMMERCIAL CREDIT funds available within 3 to 5 days from first contact.

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COMMERCIAL CREDIT funds available for months or years without calls or renewals.

WITH the money market tightening, executives who adopted COMMERCIAL CREDIT's working capital method primarily because they needed more cash than was available from usual borrowing sources are placing equal importance on the fact that money obtained through COMMERCIAL CREDIT's method is not subject to calls or renewals. If you now use or contemplate using outside funds, we would like to give you the many features and benefits of COMMERCIAL CREDIT's method which manufacturers and wholesalers are using at the rate of 600 MILLION DOLLARS this year.

Write or wire the nearest COMMERCIAL CREDIT CORPORATION office below and say, "Send me information about method offered in *Modern Industry*."

BALTIMORE 1—200 W. Baltimore St.
CHICAGO 6—222 W. Adams St.
LOS ANGELES 14—724 S. Spring St.
NEW YORK 17—100 E. 42nd St.
SAN FRANCISCO 6—112 Pine St.

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COMMERCIAL CREDIT COMPANY

Capital and Surplus Over $125,000,000

continued

lists minimum and maximum going wage rates on 266 industrial jobs, records prevalence of various amounts of wage increase established in Cleveland labor negotiations in the last year, and gives a handy rule-of-thumb guide to the cost of "welfare" and "security" benefits for employees.

Even more novel than the extensive breakdown of data is a "policy guide" section which details, practise by practise, the point in the growth of a company at which—in Cleveland practise—a particular practise is adopted or changed. Thus, a small company in the process of expansion, can get a forecast of what areas of personnel policy it will probably need to look into within the next year or two.

Because Cleveland industry is highly diversified, because a wide variety of unions is represented, and because 90 per cent of the area's industrial workforce is covered by the *Guide's* data, the book may be of good use to employers in other areas as a comparative check. Associated Industries is at 805 NBC Building, Cleveland 14, Ohio.

Bridge booms as employee activity

Easily organized, appealing to employees of all ages, bridge clubs are becoming a major company-sponsored employee activity among New York office workers.

"All you need is a little co-operation from the company, and the players take care of the rest," says Henry W. Steinhaus, chairman of the Equitable Life Assurance Society bridge club and president of the Metropolitan Commercial Bridge League. He saw the club in his company grow from a handful of unorganized lunch-period games among a dozen or so people to a program now involving hundreds.

At Steinhaus' suggestion, the company granted use of its lunch room for evening play and distributed announcements of bridge club events through its home office bulletin boards and its floor captains. That was all the organizing that was needed. Now there are regular bridge sessions and instruction for

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How do YOU handle TRAVEL EXPENSES?

When your traveling personnel reimburse themselves by means of **controlled, protected** TRAVELETTERS, your company benefits by saving the administrative and clerical costs of expense checks, by speeding auditing procedures, by improved expense control. And the traveling man becomes more efficient without the worry of being delayed or stranded without funds.

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You'll be pleased to learn of the advantages your company can enjoy by using TRAVELETTERS too! Write for information.

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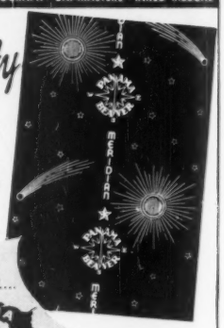
Quality that Wears



short cut to office efficiency....

synonym of highest Quality

No fair-weather soldiers are these! Built to stand the gaff in modern offices, each Ribbon and Carbon is supremely serviceable for its own purpose — head and shoulders above the mass-production commonplace! A joy to executives, secretaries and parboiled purchasing agents!

PANAMA-BEAVER *Ribbons and Carbons*

MANIFOLD SUPPLIES COMPANY
Coast to Coast Distributors
188 Third Avenue, Brooklyn 17, N. Y.

FILTERED DAYLIGHT

Sikorsky Aircraft gives its people the best in daylighting in this Bridgeport, Conn., plant. Big windows bring in an abundance of filtered daylight. It's Blue Ridge Frosted *Aklo** Glass.

This blue-green glass reduces glare. It filters out harsh, eye-fatiguing rays of light. Frosted *Aklo* tones down sky brightness and direct sunlight. Shadows are softened. Reflections from shiny objects are subdued. Seeing is more comfortable.

Aklo Glass shuts out as much as 44% of the sun's heat. That makes interiors more pleasant. It reduces air-conditioning load, especially when used on south and west elevations.

You can test *Aklo's* performance. Ask your L·O·F Distributor or Dealer to let you compare regular glass and *Aklo* Glass in a radiometer. You'll see how effectively it reduces glare and sun heat. Mail the coupon for full information.

BLUE RIDGE
AKLO GLASS

FILTERS DAYLIGHT

Libbey-Owens-Ford Glass Co.
Patterned & Wire Glass Sales
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☐ Please send me your book "Filtered Daylight".
☐ I would like to see a Radiometer demonstration.

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(please print)
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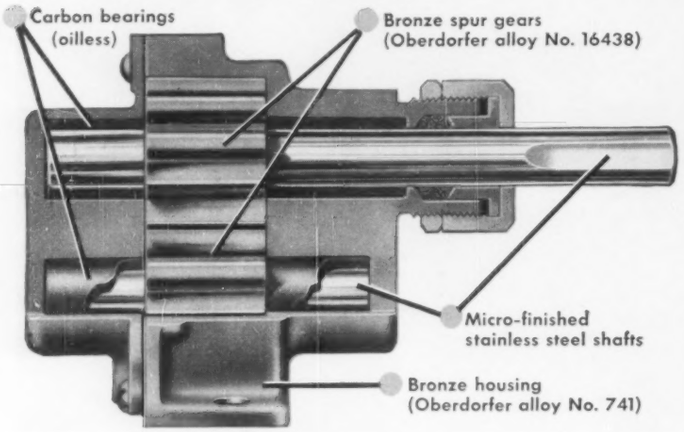
City _____ State _____

To the industrial pump market interested in competitive sales success

Our 1953 production of bronze pumps includes six lines, many new designs, closer machining tolerances throughout and at our customary low prices.


Carbon bearings (oilless)
Bronze spur gears (Oberdorfer alloy No. 16438)
Micro-finished stainless steel shafts
Bronze housing (Oberdorfer alloy No. 741)

Series No.	Gal. per min. 1725 r.p.m.	Pump type	Lbs. pressure per sq. inch	No. of pumps in series
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II	2-4	close coupled bronze rotary gear	0-100	2
F	50-150	high volume bronze rotary gear	0-150	5
IV	6-21	rubber impeller bronze	0-30	3
55	2-23	standard bronze rotary gear	0-100	12
G	2-25	standard bronze centrifugal	2-10	3

Any of the above pumps are available free of charge to original equipment manufacturers for test purposes on their machines designed for resale.

Write us the details of your installation. We have accumulated records of a wide variety of successful applications in the past fifty-five years. We may have the answer to your problem in our files.

See our catalog in Sweet's PRODUCT DESIGN File

OBERDORFER BRONZE PUMPS

Industrial Pump Div., Oberdorfer Foundries, Inc.
738 Thompson Rd., Syracuse, N. Y.

Address the 1953 edition of the Oberdorfer Industrial Pump catalog to:

NAME.....

COMPANY.....

ADDRESS.....

Do you want a factory representative to call ☐ Yes ☐ No

continued

beginners as well as intra- and inter-company competition.

Players range from senior officers to the newest employees and include both young and old. Members of employees' families and personal friends are invited to participate, as well, increasing club popularity.

Putting zest into the worker's life

Life in an American factory is not necessarily grim.

The hoopla and ballyhoo of the wartime Jack & Heintz plant are now one with Nineveh and Tyre, but at the Paulsen-Webber Cordage Corporation in New York there are a number of practises not found in standard personnel handbooks.

Many employees are onetime mariners so, when the coffee break occurs at 10 AM and 3 PM it is announced by a ship's bell. There is a radio in the plant for every five or six employees, and employees are allowed to set their own starting time, so long as they work full hours. Most want to come in pretty early, anyway, and most of them can swing from one job to another with equal skill.

Highlight of the Manhattan cordage works, however, is a trapeze installed in the anteroom to the men's room by President Fred Paulsen, a gentleman who gets up at 5 AM daily and runs, not walks, for two miles before settling down to breakfast.

Paulsen believes in exercise for health and, like him, almost every employee passing the trapeze stops and chins himself a few times for good health's sake.

Less amazing, perhaps, but just as unusual are the gaiety and light illustrations of the new employee handbook just issued by the Hollywood-Maxwell Brassiere Company of Hollywood. Cartoon-laden, it uses terms of trade to focus attention on its content: the section on employee benefits, for example, is headed, "A Full Cup."

Air mail... snail-paced!

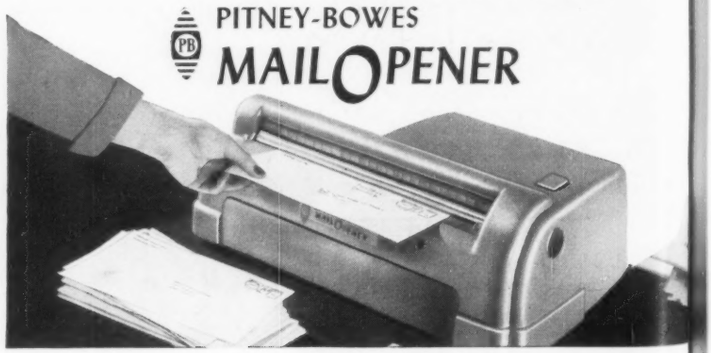
Important mail flies like an eagle to get to your office. Then it gets bogged down to a crawl by the slow process of hand-slitting-open before your office people receive it and get the day's work started.

Consider the valuable working time a PB MailOpener will save! This electrically powered LE Model, for example, opens a whole morning's mail in a jiffy—thin envelopes or fat; any size, any kind. Swiftly, safely trims off a hairline edge as fast as you feed it. There's a MailOpener for the smallest office. Ask your nearest PB office to demonstrate. Or write for free illustrated booklet.

PITNEY-BOWES, INC., 1506 Pacific St., Stamford, Conn.
Originators of the postage meter, 93 offices in U.S. and Canada.

FREE: *Handy wall chart of Postal Rates for all classes of mail, with parcel post map and zone finder.*

PITNEY-BOWES
MAILOPENER



"a Way of Life and you can have it FREE!"

Perhaps it will never be among the assets on your balance sheet, but when a way of life contributes to employee efficiency and happiness—and helps you operate your business more profitably—then it becomes a decided asset, invaluable to your success.

The way of life prevailing in West Penn Electric's service area constitutes a "good will" asset of the many business firms and industrial plants located there. This area in five states embraces hundreds of small, friendly communities where living and working conditions are pleasant and progressive.

Because it's part of small-town life to be proud of local industries, employers in our service area receive the cooperation of workers—and workers enjoy the comfortable way of living characteristic of small-town life.

Are you considering a new office, plant or laboratory? Our "check list" provides a simple way of defining your needs. Write or phone Area Development Department of The West Penn Electric Company, Room 915, 50 Broad Street, New York 4, N. Y. (WH 4-3740).

West Penn Electric System

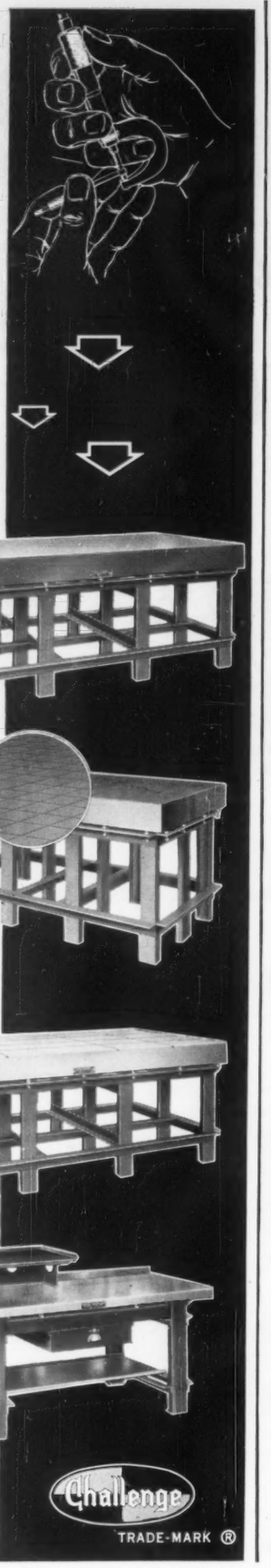
Monongahela Power Company • The Potomac Edison Company • West Penn Power Company

WHERE PRECISION COUNTS

SPECIFY

Challenge®

Challenge offers a wide selection of precision equipment for layout, inspection, checking, lapping, welding and assembly operations. Note the features of these time-saving devices — and send for the Challenge catalog which gives full details on the complete line.



LAYOUT SURFACE PLATES

Built of special analysis semi-steel with a smooth, square surface-precision ground or planer finished. Standard sizes range from 12" x 18" to 54" x 144". Plates can be grooved and keyed so that two or more can be assembled into one huge unit of unlimited size. Surface Plates with "Tee-Slots", grooving, scoring or machining are available on special order. (Tee-slots cannot be added after plates are made.) All-steel stands are arc welded for rigidity. Lock leveling screws assure a perfectly level surface.

LAPPING PLATE

Designed for precision lapping of delicate joints on which no sealer is used. Ideal for crank cases, cylinder heads, gear housings and other parts which must be lapped perfectly to avoid oil leaks. Plates have 1/16" grooves, ½" apart, running the full length and width of the surface.

WELDING TABLES

Built of special analysis semi-steel to provide a smooth, accurate surface with "Tee-Slots" for assembling, locating and welding. They are available in three standard sizes; 30" x 60", 48" x 96" and 54" x 144"; other sizes to order. A sturdy all-steel stand with leveling screws is included with table.

WORK BENCHES

Durable cast-iron top two inches thick — will not warp, shrink, splinter or burn. Leveling screws insure a perfectly level and accurate surface. Legs are strong and solidly braced. Three styles . . . Four sizes: (top dimensions) 28 x 48 and 28 x 60 with four legs; 28 x 72 and 28 x 84 with six legs.

745

THE CHALLENGE MACHINERY CO.

Office, Factories and Show Room:
Grand Haven, Mich.

Challenge
TRADE-MARK ®

COLOR

continued from page 58

The designer who controls color intelligently is valuable to industry. He designs in color and creates eye appeal for the product, at the same time anticipating the additional impact to be gained from effective lighting. Exact choice for the job at hand, that sense of the appropriate for which we are indebted to the ancient Greek colorists who contributed color standardization and rules of harmony, is a primary requirement.

The buying public is not fooled by second-hand use of color—the expedient adaptation of some color that may have been used with success for some other product. Combination of colors, effect of background, and appearance under artificial illumination as well as daylight, are further developments requiring experience and knowledge of effects.

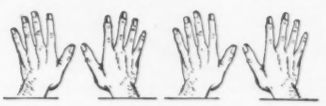
A complex example will best make the point. In the modern supermarket there is a vast display of fruits, vegetables, baked and packaged goods, and meats that must all be illuminated to retain the attractions of their appetizing colors. When the Kroger Company wanted to style and light the new supermarkets they are building, we sought to avoid the common type of strongly lighted ceiling that gives the impression that lighting fixtures are the principal display of the store.

Great stress was laid on the lighting, because the colors of foods must be perceived in proper light, but to bring out the true colors in the most candid and undistorted way a radical new lighting fixture was designed. The result is that the new Kroger stores are evenly lit, glareless, and comfortable for marketers. They attract attention, they sell more foods, and they emphasize the individual character of this chain of supermarkets.

The color-corrected lighting used throughout the Kroger supermarket does not distort the appearance of any item of merchandise. The white suet on fresh meat appears white; the meat itself looks appetizing and fresh; vegetables appear as they do in sunlit gardens; and packaged and baked goods look their best.

For the general illumination, we

One DUO washes 4 hands



Maximum in Sanitary Cleanliness

- √ *No faucets* to touch or maintain
- √ No possible transmission of germs
- √ Clean running water from sprayhead
- √ No water waste, — foot pedal controls water flow — no chance of leaving water running unnecessarily
- √ Temperature control valve to regulate water

Like the nationally used larger Bradley Washfountains, the DUO has gained wide acceptance for—

- public buildings
- factories and mills
- plant cafeterias and laboratories
- schools
- institutions

FOOT-CONTROL

BRADLEY WASHFOUNTAIN CO.
2275 W. Michigan Street
Milwaukee 1, Wisconsin

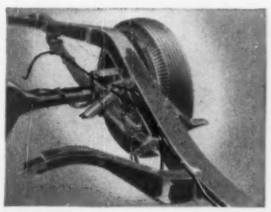
Write for bulletin K-711.

BRADLEY *Duo washfountains*

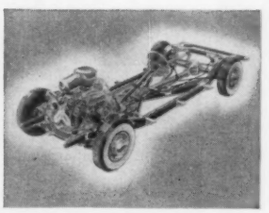
Distributed through Plumbing Wholesalers

Your safe stop here was planned by strangers

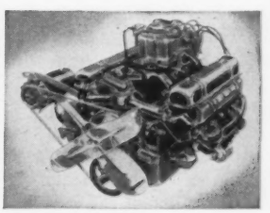
You're cruising along the highway. You have to stop suddenly. You do. Your safe, sure stop was planned by strangers — the men who engineered your car. They made your brake lines as leakproof, shockproof, vibration-proof as possible. They made your brake lines of Bundyweld Tubing, *fifteen times stronger than necessary to protect your life.*



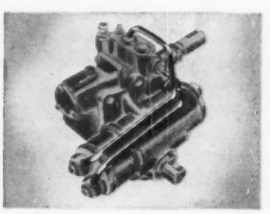
1 Brake lines of Bundyweld give you the extra protection they've given to millions of motorists during billions of miles of motoring safety. No hydraulic brake failures from brake-fluid leaks or broken brake-tube walls in your car.



2 You get Bundyweld protection in those all-important oil lines, too. Bundyweld is leakproof, extra-strong, trouble-free. So much so that it's used in 95% of today's passenger cars in an average of twenty vital applications each.

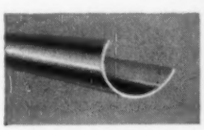


3 Your gasoline lines take heavy punishment from flying stones and from severe vibration during your car's life. They don't leak, don't collapse, don't get you into trouble. They're made of tough, rugged, double-walled Bundyweld Tubing.

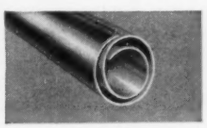


4 If you have power steering or want it, you'll be glad to know Bundyweld safety goes with it. Unfailing lines of Bundyweld Tubing in power steering mechanisms help the manufacturer of your car give you completely reliable power steering.

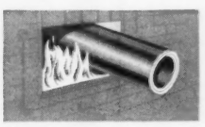
Why you're safer with Bundyweld Tubing



1 Bundyweld Tubing begins as a single strip of tough, copper-coated steel.



2 We carefully roll the single strip like this, make it into a double-walled tube.



3 We take the tube, fire it in a furnace, where the copper bonds with the steel.

4 Result: Bundyweld Tubing: double-walled, strong, copper-sealed, leakproof.

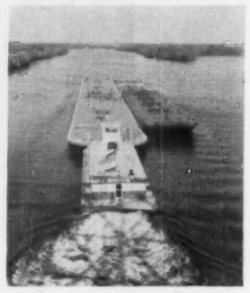
Bundyweld®
Tubing
"The lifeline of your car"
BUNDY TUBING COMPANY
DETROIT 14, MICHIGAN

used four 8-foot, cool-white lamps in each fluorescent fixture on the ceiling, with attached perforated-aluminum baffles to permit some light to come through, but to direct most of the light downward onto displays. To offset a slight blue cast in the light, we enameled the fixture base with a certain shade of ivory that added a warm tinge and resulted in a total white reflected light. Over the open-case meat counters, supplementary incandescent units were used to provide additional intensity for penetration of cellophane covering of the meats displayed—and thus avoid color distortion.

Supermarket Sales

Supermarkets sell more than foods. One of my most recent assignments has been to design the displays of non-food items, to give eye appeal to the various housekeeping aids, the cleaning supplies, the light appliances, the food and cooking magazines, that are offered in the up-to-date stores of this type. These are items that the shopper uses and wants, but may easily overlook when shopping with menus and pantry stocks in mind, unless they are forcibly brought to her attention. Attractive display of the non-food item is the answer.

The general color plan developed for the Kroger supermarket relates the various departments and creates a harmonious impression upon the customer entering the store. Yet special accents appropriate to the varying types of foods on display



DEVANEY PHOTOGRAPH

serve to heighten interest of the shopper circulating through the supermarket. At certain points, more intense colors dramatize special displays.

Showmanship — primarily good design, plenty of correct color, and proper lighting—must set the pace in this highly competitive merchandising field. The advance from the

NEW "STAND UP" FURNACE IS A "LAY DOWN" TOO!

thanks to BORG-WARNER engineering

Of the many recent developments in heating equipment, one of the newest and most versatile is this Norge Heat "Lay Down—Stand Up" furnace. A fully automatic oil fired unit, utilizing the counterflow heat exchange principle, it can be fired *either* vertically or horizontally. And with unusual compactness, plus front flue outlet, space requirements are reduced to a minimum. All of which permits far greater flexibility of installation—in tight corners, in attics, in crawl spaces, and even suspended from ceilings.

This new heating unit is a product of Borg-Warner's Norge Heat Division. And like every unit in Norge Heat's complete line of gas, oil and coal fired heating equipment, it embodies the advanced design and skilled engineering that go into every B-W product.

"Design it better—make it better" is the way Borg-Warner serves America every day—through the automotive, aviation, farm implement, home appliance and marine industries.

BW *ENGINEERING MAKES IT WORK* BW *PRODUCTION MAKES IT AVAILABLE*

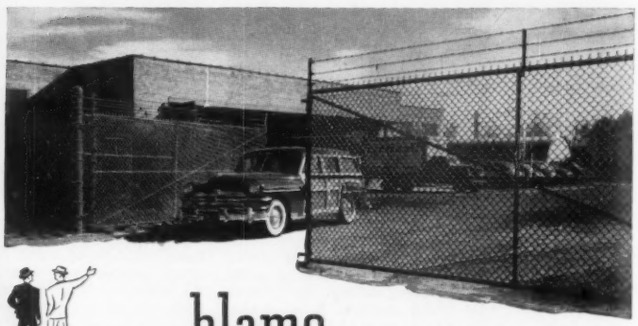
Almost every American benefits every day from the 185 products of BORG-WARNER

ENGINEERING B-W PRODUCTION

THESE UNITS FORM BORG-WARNER, *Executive Offices, Chicago:* ATKINS SAW • BORG & BECK • BORG-WARNER INTERNATIONAL • BORG-WARNER SERVICE PARTS • CALUMET STEEL • CLEVELAND COMMUTATOR • DETROIT GEAR • FRANKLIN STEEL • INGERSOLL PRODUCTS • INGERSOLL STEEL • LONG MANUFACTURING • LONG MANUFACTURING CO., LTD. • MARBON • MARVEL-SCHEBLER PRODUCTS • MECHANICS UNIVERSAL JOINT MORSE CHAIN • MORSE CHAIN CO., LTD. • NORGE • NORGE HEAT • PESCO PRODUCTS REFLECTAL • ROCKFORD CLUTCH • SPRING DIVISION • WARNER AUTOMOTIVE PARTS WARNER GEAR • WARNER GEAR CO., LTD. • WOOSTER DIVISION

PAGE FENCE - *Since 1883*

• AMERICA'S FIRST WIRE FENCE •



Could you **blame** yourself if failure to safeguard property resulted in loss? After all, isn't property protection a responsibility of all management? Security is a job for Page Chain Link Fence, available in heavily galvanized Copper-Bearing Steel, rust-immune Stainless Steel or corrosion-resisting Aluminum. But PAGE means more than a quality product. It is a complete fence service, performed by more than 100 firms having technical training and fence erecting know-how, and conveniently located throughout the country. For illustrated data on Page Fence and name of experienced firm nearest you—

Write to PAGE FENCE ASSOCIATION in Monessen, Pa., Atlanta, Bridgeport, Chicago, Denver, Detroit, Los Angeles, Philadelphia, New York or San Francisco.

PRODUCT OF PAGE STEEL & WIRE DIVISION OF AMERICAN CHAIN & CABLE COMPANY, INC.

what'll you have?

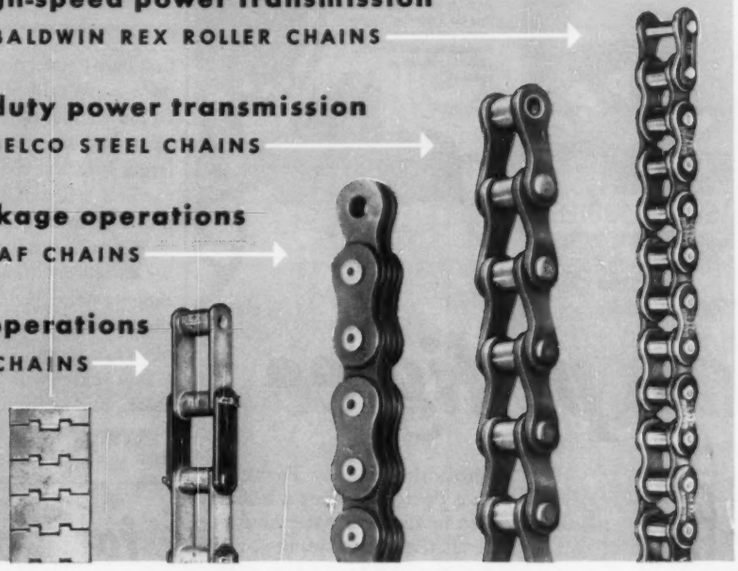
efficient high-speed power transmission
BALDWIN REX ROLLER CHAINS

economical heavy-duty power transmission
REX CHABELCO STEEL CHAINS

durable tension linkage operations
BALDWIN REX LEAF CHAINS

reliable elevating operations
REX COMBINATION CHAINS

smooth conveying operations
REX TABLETOP CHAINS



Chain Belt's Got it!

Yes, whatever your requirements for power transmission or conveyor chains, Chain Belt has the exact size and type you need for most efficient, economical operations.

There is no one chain that's right for all applications...there is a *right* chain for each application. That's where it pays you to choose from the complete Chain Belt Line. You cut costs...and get the most out of your machines and conveyors. Don't take chain for granted. Check over the chain application in your plant today, and with the help of your Chain Belt Field Sales Engineer, see where you can cut costs—in chain selections.

For helpful information, mail the coupon.

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Distributors located in principal cities in the United States and throughout the world
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Gentlemen:
Please send me information on Rex and Baldwin-Rex chains
☐ For power transmission ☐ For conveying ☐ For tension linkages
☐ Slide rule drive selector for slow to medium speeds.

Name.....
Firm.....
Address.....
City.....*Zone*.....*State*.....

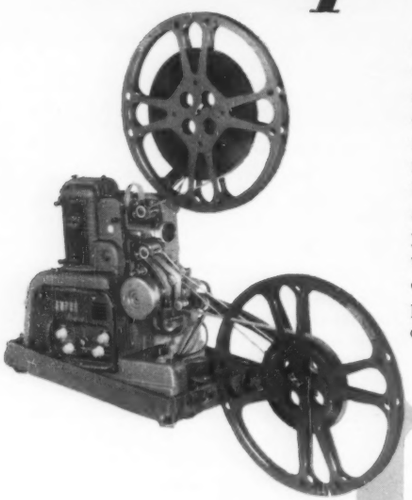
picture power

"Repeater"
The portable movie theatre
Projects sound films on its own 15"x11" latex screen. Sets up in 60 seconds. No rewinding—film always ready for showing. Point of sale, booths, meetings.

For larger groups
Premier-40
Brilliant screen illumination, true tonal fidelity. Single-frame and reverse operation. Sound and silent speeds. 12-inch companion speaker.

AMPRO
Famous For The Finest
SILVER JUBILEE

with a pedigree



In projection, Picture Power with a Pedigree means a brilliant screen image, no matter how difficult the circumstances . . . it means sound reproduction with full presence, no matter how bad the acoustics . . . it means *impact* on the eyes and ears of your audience . . . the result of twenty-five years of precision craftsmanship in the creation and production of products for the discriminating audio-visual user.

stylist deluxe

Compact and gadget-free. Complete projector and amplifier, with speaker and carrying case, weighs only 29 pounds. Reel arms swing into place with nothing to attach. Powerful 8-inch Alnico-5 PM speaker mounted in lift-off carrying case gives base-reflex performance for theatre-presence quality. Operates at sound or silent speeds on either AC or DC. Simplified controls; quiet operation.

FREE! Ampro's new film-source book, "Screen Adventures." Helps to plan programs, tells where to get films on specific subjects. Mail the coupon today for your free copy of this useful reference book.

Ampro Corporation
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☐ Have my local Ampro Audio-Visual Dealer call to arrange a no-obligation screening of "Famous for the Finest."

☐ Send a free copy of "Screen Adventures," the new film-source guide.

Name.....

Company.....

Address.....

City.....State.....

ampro CORP., CHICAGO
In Canada, Arrow Films, Ltd., Toronto

The AUTHOR

Howard Ketcham, a pioneer in the field of color, design, and illumination as applied by major manufacturers, retail organizations, chain stores, and air and rail transportation companies, is a graduate of Amherst College. Before entering private practise he was art director for H. K. McCann Company, advertising, and later director of the Duco advisory service of E. I. du Pont de Nemours and Company.

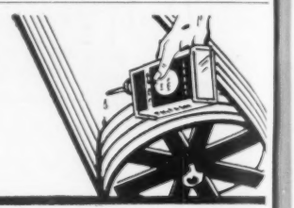
The first to transmit colors from Europe to America by cable and wireless in 1936, he also instigated the first nationwide consumer appraisals to predetermine color and design preferences for manufactured articles.

Mr. Ketcham is the editor of *American Fabrics* and *Gentry* magazines, author of several books on color and art, and a member of the Illuminating Engineering Society.

first barny supermarkets introduced prior to World War I, usually in an old warehouse, factory, or trolley barn, has brought us to-day to far larger spaces at cheap rental. Supermarkets sell a large proportion of the food sold in the United States and many of the supermarket sales are so-called "impulse sales" to the shopper who picks out something she hadn't intended to buy, because of its eye appeal.

Not only will proper lighting, color, and design help to guide shoppers along desired paths within a store, but these same elements should be considered in "face-lifting" operations that serve to attract buyers to the building. Motorists approaching the Deep Rock Corporation service station in Tulsa, Oklahoma, were blinded by the glare of canopy lights, before the restyling and relighting of the station. As gasoline pumps should be well-lighted for accent and recognition, so a horizontal fixture was designed to hang above the pumps, with open louvered bottom to shed cold-cathode fluorescent light downward onto the pumps rather than into the eyes of the pumps as well,

for Maximum Efficiency



By keeping traction in belts of precision cutting tools, BELTRACTION prevents chattering and misalignment—and minimizes rejects and costly reworking.

TREAT BELTS WITH Beltraction

Every Time You Lubricate Bearings!

110,000 users of BELTRACTION Liquid Belt Treatment find that it pays to make it a habit to apply this effective conditioner to belts regularly. Because BELTRACTION increases traction 200 to 500%, it prevents costly delays and breakdowns due to belt slippage. Especially recommended for V-belts. Write for interesting folder "Horse Power Where and When You Need It" which gives results of tests of BELTRACTION by United States Testing Company, Illinois Institute of Technology and other prominent laboratories.

BELTRACTION COMPANY
1813 W. Winona St. Chicago 40, Ill.

FOR ALL TYPES OF BELTS • V-TYPE, FLAT OR ROUND

THE NATIONAL CITY BANK
OF NEW YORK

Head Office • 55 WALL STREET • *New York*

67 Branches in Greater New York 57 Branches Overseas

Statement of Condition as of June 30, 1953

ASSETS

Cash, Gold and Due from Banks	$1,496,745,018
United States Government Obligations	1,335,996,807
Obligations of Other Federal Agencies	31,981,981
State and Municipal Securities	460,401,598
Other Securities	90,321,310
Loans and Discounts	2,276,555,200
Real Estate Loans and Securities	368,251
Customers' Liability for Acceptances	17,270,391
Stock in Federal Reserve Bank	9,600,000
Ownership of International Banking Corporation	7,000,000
Bank Premises	31,290,191
Other Assets	5,137,654
Total	$5,762,668,401

LIABILITIES

Deposits		$5,267,520,007
Liability on Acceptances and Bills	$34,579,041	
Less: Own Acceptances in Portfolio	14,219,075	20,359,966
Due to Foreign Central Banks (*In Foreign Currencies*)		17,160,400
Items in Transit with Branches		552,400
Reserves for:		
Unearned Discount and Other Unearned Income		22,519,287
Interest, Taxes, Other Accrued Expenses, etc.		41,333,064
Dividend		3,450,000
Capital (*7,500,000 Shares—$20 Par*)	$150,000,000	
Surplus	170,000,000	
Undivided Profits	69,773,277	389,773,277
Total		$5,762,668,401

Figures of Overseas Branches are as of June 25.

$394,259,691 of United States Government Obligations and $19,351,200 of other assets are deposited to secure $267,602,946 of Public and Trust Deposits and for other purposes required or permitted by law.

(*Member Federal Deposit Insurance Corporation*)

Affiliate of The National City Bank of New York for separate administration of trust functions

CITY BANK FARMERS TRUST COMPANY

Head Office: 22 William Street, New York

Capital Funds $31,638,507

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IRIDITE®
FINISHES

for zinc, cadmium, aluminum and cuprous metals

provide corrosion resistance
paint base
choice of appearance

And they are easy to apply! Just a simple chemical dip for only a few seconds produces the coating.

LOW MATERIAL AND SHIPPING COSTS

combine to make Iridite the most economical chromate finish you can buy. Many Iridite chemicals are packed in powder form, thus can be shipped to you in steel pails at freight savings of up to 75%! Pails take less storage space, are easier to handle, eliminate carboys, need not be returned.

WHY NOT TEST IRIDITE ON YOUR PRODUCTS? Write for literature and send samples for free test processing. See "Plating Supplies" in your classified telephone directory or write direct.

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Manufacturers of Iridite Finishes
for Corrosion Protection and Paint Systems on Non-Ferrous Metals; ARP Plating Brighteners.
West Coast Licensee: L. H. BUTCHER COMPANY

accenting the color and brand name. It resulted in footcandle readings of 12.76 around the pumps, as compared to 1.51 footcandles of the former glare of light. The even light eliminated "spotty" areas and also confined illumination to the service station area—saving wasted light, increasing the lighting cost by a negligible amount, and making the station stand out effectively.

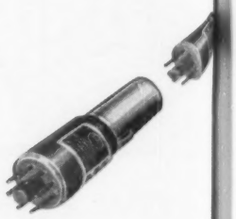
High-Lighting Points

Color was considered in terms of both the artificial light and the natural daylight under which it would be deserved. The individualized color scheme of the service station was renovated and the sides of the new horizontal fixture were colored to match, day or night. In another assignment in the same merchandising field, when color-styling the service stations for Cities Service Oil Company it was decided to call attention to the high-test gasoline pumps by painting them with red, in contrast to the green-and-white scheme adopted for the stations and the standard fuel pumps. The color change apparently worked; sales of the higher priced gasoline were boosted appreciably. When selected with full knowledge of its effectiveness, and dramatized by location and lighting, color is a dependable sales aid.

My 25 years of experience as a color-design-illumination engineer, lead me to say flatly that color and light are as important to business as they are to life itself. When adequately applied, by one trained in their properties and in their specific effects on people, color and light can:

1. Impart to a product, plant, office, salesroom, or display that prestige and individual identity that distinguishes the companies using such famous trademarks as the Woolworth sign, the Campbell soup can, and the Victor Red Seal label —or the unique character created by the new blue-glass Lever House;
2. Slash installation, inventory, and maintenance costs;
3. Attract customers and increase sales, through the pleasing impressions created by appropriate colors seen under proper lighting;
4. Add to the "user benefit" of products, since products with the right color application become more

ELECTRONIC
• Research
• Design
• Development
• Production



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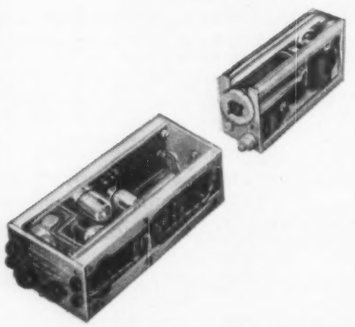
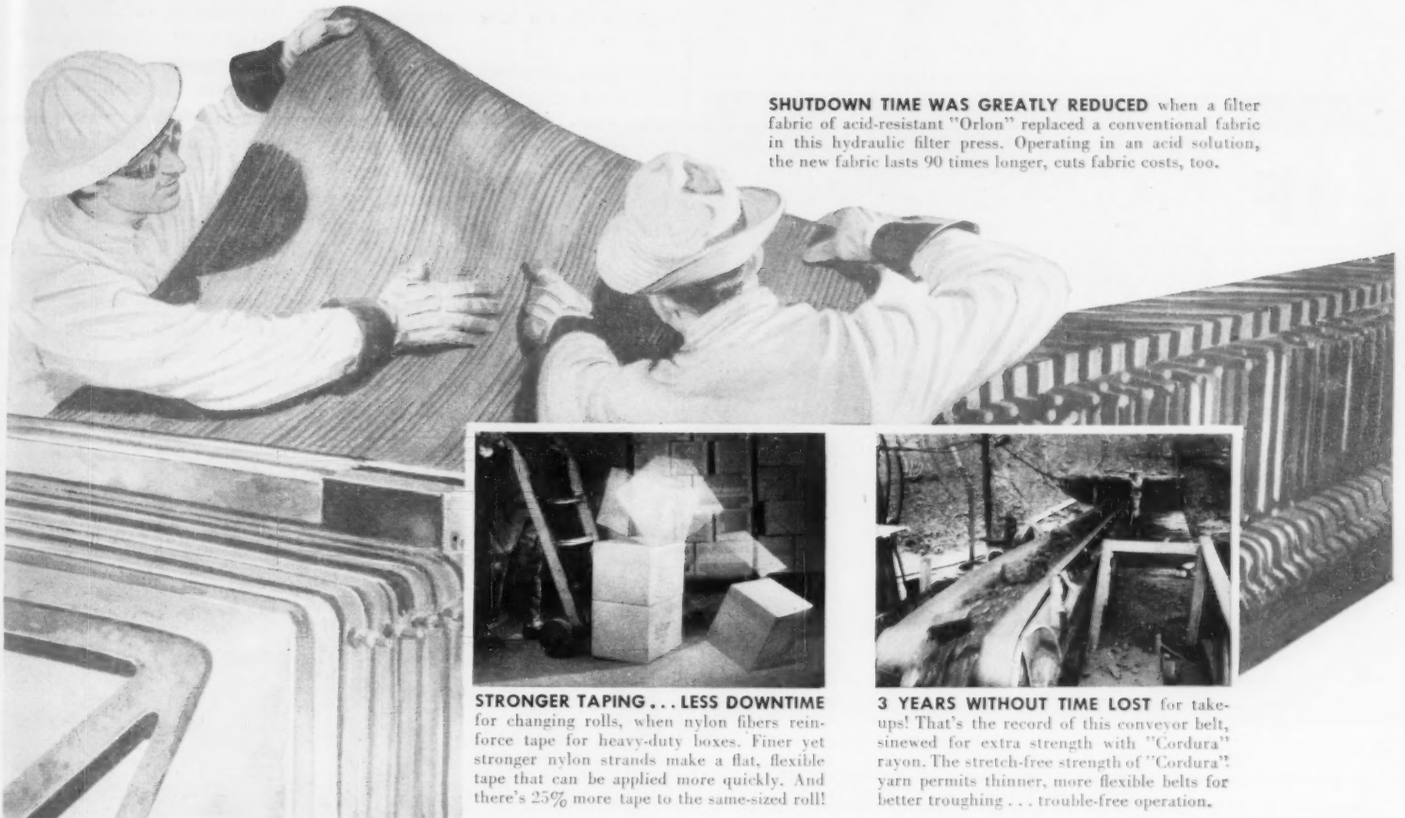


Packaged Circuits

AUDIO PRODUCTS CORPORATION
RADAR • COMMUNICATIONS • NAVIGATION •
2265 WESTWOOD BOULEVARD, LOS ANGELES 64, CALIFORNIA



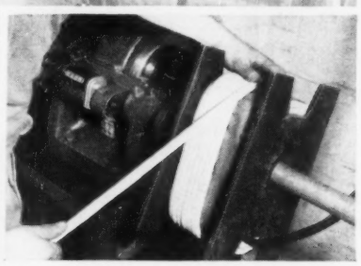
SHUTDOWN TIME WAS GREATLY REDUCED when a filter fabric of acid-resistant "Orlon" replaced a conventional fabric in this hydraulic filter press. Operating in an acid solution, the new fabric lasts 90 times longer, cuts fabric costs, too.

STRONGER TAPING . . . LESS DOWNTIME for changing rolls, when nylon fibers reinforce tape for heavy-duty boxes. Finer yet stronger nylon strands make a flat, flexible tape that can be applied more quickly. And there's 25% more tape to the same-sized roll!

3 YEARS WITHOUT TIME LOST for take-ups! That's the record of this conveyor belt, sinewed for extra strength with "Cordura" rayon. The stretch-free strength of "Cordura" yarn permits thinner, more flexible belts for better troughing . . . trouble-free operation.

Man-made fibers are speeding production

. . . AND MAY WELL DO IT FOR YOU



MORE EFFICIENT WIRE WRAPPINGS for transformer cables are made with "Dacron". This remarkable fiber gives increased abrasion resistance, smaller wrapping size, smoother surfaces for easier transformer assembly. Costs less than standard insulation, too!

Today, man-made fibers are helping industry speed production . . . make better products . . . cut costs. New properties . . . in new combinations . . . plus the greater uniformity of Du Pont man-made fibers make possible this new efficiency and economy.

Du Pont's five versatile fibers—nylon, acetate, "Cordura", "Orlon" and "Dacron"—still have a great untapped potential as raw materials for industry. They may offer *you* opportunities for improving products and processes—as they have in the examples shown here. It will pay you to investigate them in terms of *your* needs. Write us for full information, mentioning the uses you have in mind. E. I. du Pont de Nemours & Co. (Inc.), Room 2520-N, Wilmington 98, Del.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

FIBERS TO FIT INDUSTRY'S NEEDS

NYLON

High strength wet and dry; elastic, shock-resistant, high flexibility. Resists deterioration from oils, alkalies. Tough, durable, lightweight. High abrasion resistance.

CORDURA*
high tenacity rayon

High strength with low cost, low bulk; high resistance to stretch; resistance to heat. This high tenacity rayon has toughness, good durability and flexibility.

ORLON*
acrylic fiber

Dimensionally stable; strong wet and dry; low moisture absorption; resistant to sunlight, mildew and weather exposure. High resistance to acids and other solvents.

DACRON*
polyester fiber

High strength wet and dry; outstanding heat resistance; good chemical resistance; stretch resistance; good electrical insulating properties. Withstands abrasion, flexing.

*DU PONT TRADE-MARK

IF you are a manufacturer and

IF your products are painted and

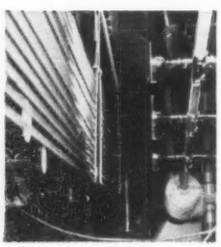
IF you're using old fashioned finishing methods,

You should investigate the possibilities of The RANSBURG NO. 2 PROCESS An amazing development in electrostatic spray painting.

In plant after plant, Ransburg equipment is providing increased production—with a higher quality finish—at a fraction of former finishing costs.

On most production lines, the Ransburg No. 2 Process will give 50% to 100% more pieces per gallon than ANY other spray finishing system. The increase is even greater over conventional hand spray.

Here's an example of the unmatched efficiency of the Ransburg No. 2 Process. Paint mileage was stepped up 250% on the installation at the Graber Company in Middletown, Wisc. With an automatic spray finishing system, this company formerly finished 750 to 1,000 feet of curtain rod per gallon of paint. Now, with the Ransburg No. 2 Electro-Spray Process, they paint 3,500 feet of rod with one gallon of paint. Too, they're getting a more uniform coating, with practically no rejects, and maintenance and cleanup is only one third of former needs.



WANT TO KNOW WHAT RANSBURG NO. 2 PROCESS CAN DO IN YOUR PAINTING DEPARTMENT? Write for our brochure which contains detailed information on the Ransburg No. 2 Process, as well as production performance on numerous installations.

RANSBURG

Ransburg **ELECTRO-COATING CORP.**

INDIANAPOLIS 7, INDIANA

valuable in the user's estimation; and

5. Raise the morale—and efficiency—of office and plant workers who enjoy colorful surroundings and work better when the lighting enables them to see without eye strain. Even prisons now recognize the psychological benefits of good colors.

Translate these facts into practical applications. They are effectual in all departments of business activity. Recently I was called upon by the Bell Telephone Laboratories to develop the best colors for use on telephones, for home and business installation, and in three months we prepared the recommendations based on knowledge of what buyers —or in this case, subscribers— wanted, as well as knowledge of color qualities and uses. These gave the key to practicable colors for the purpose.

At present, we are developing interesting, modern coach interiors for the Southern Railway System, which asked for styling and new, modern lighting for coaches, dining, and lounge cars. This railroad wants a colored-plastic wall treatment that will not call for periodic repainting, a wise color investment from the standpoint of maintenance. Our effort is to use color for a cheerful effect and also to counteract the tunnel-like appearance of the conventional railroad coaches.

The apparent shortening of a passenger coach, which involves lighting effects as well as skillful handling of color, is an assignment we worked out for airliners over a ten-year period, with the styling of interiors for Pan American's planes. The proper combination of color, light, and design was achieved in planes in order to give passengers confidence and to minimize the noise and heavy vibration of the then new experience of scheduled plane travel. The emphasis was on clear light colors, thick carpets, and luxurious upholstery. Not the least of the objectives was to give passengers a sense of permanence, which cheaper furnishings and noisy planes had failed to give.

The promiscuous introduction of new colors has given way to accurate gaging of the public preferences by means of factual color surveys. This market testing, by largely eliminating the speculative element and prejudices of business heads who had been guessing at color tastes, sharply reduces risks when restyling. Approaching the wrong people, or the wrong area of the country, or in the wrong season, or with an insufficient range of representative colors—or a dozen more "wrongs" that waste time and money—can only get a wrong result. It is the right type of survey,

Close-up view of meat counters. Wallpaper is in colors related to the rest of the store interior, meat is highlighted with color corrected light. Facing counter is enameled in special beige color to eliminate glare effect of white counters.

You get *EXTRA* advantages with

LO-HED HOISTS

DESIGNED to operate with top speed and ease . . . built for longer working life . . . Lo-Hed Hoist has cut material handling costs in plants from coast to coast.

And beyond that, Lo-Hed has *extra* features that bring maximum safety and efficiency. Its bottom block, for example, is completely shrouded. On A.C. installations a transformer puts 110 volts instead of line voltage at the push button controls. Its hook is suspended on an oil-impregnated bearing that does away with tangled lines.

Available in five suspension types and in capacity ranges from 500 to 24,000 lbs., Lo-Hed gives you low headroom, too, for which you pay no premium. Mail the coupon below for complete information . . . it may lead to savings that count up, year after year.

LO-HED MEANS LOW OVERHEAD

LO-HED CAR PULLER . . . rugged . . . electrically-driven . . . moves railroad cars on private sidings cheaply and safely . . . cuts demurrage costs . . . Saves money *inside* a plant, too; pulls anything within its capacity that can roll or slide . . . up grades, around corners.

AMERICAN ENGINEERING
COMPANY
PHILADELPHIA 25, PENNA.

AE Products are: Taylor and Perfect Spread Stokers, Marine Deck Auxiliaries, Hele-Shaw and Hydramite Fluid Power, Lo-Hed Hoists, Lo-Hed Car Pullers.

American Engineering Company
2520 Aramingo Avenue, Philadelphia 25, Pa.

Gentlemen: I am certainly interested in efficiency. Send me full information about ☐ Lo-Hed Hoists . . . ☐ Lo-Hed Car Pullers.

Name_____ Title_____
Company_____
Address_____
City_____ Zone_____ State_____

capably conducted, that produces the information which will be sales insurance.

Preference Survey

An excellent example of the practical application of this specialized knowledge and technique is the recent acceptance by the Dodge Division of the Chrysler Corporation of a program to ascertain and specify the seven most-wanted colors for automobile exteriors, and the most-wanted colors and textures for interiors and trim. This is a program which will lead to final color choices for the new Dodge cars, and color and texture selections for interiors, including headlining, side walls, upholstery, floor coverings, interior finishes, and the accent colors for steering wheel and control knobs.

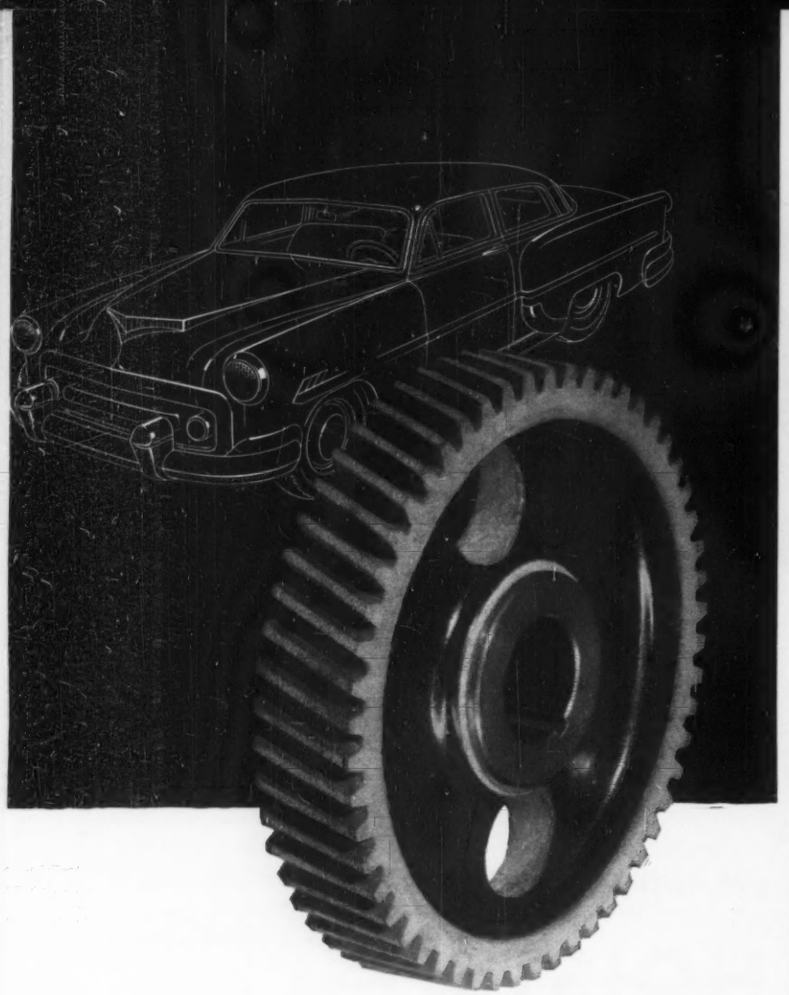
The first stage of the program will be to learn what is wanted by consumers, both men and women, by conducting a coast-to-coast survey. Trained survey personnel will poll a representative cross-section of consumers to ascertain preferences of buyers in the price bracket represented by the Dodge car. Colors to be used in the test will be planned

REICHHOLD CHEMICALS PHOTOGRAPH

especially for the design of the new Dodge models. These colors, representing harmonious interior-exterior combinations, will assure a suitable variety and range for significant choice.

The final report will include color recommendations, complete with samples of the colors and textures and materials preferred by the con-

DUN'S REVIEW AND MODERN INDUSTRY will appreciate early notices of change of address. Usually, it is necessary to have four weeks' notice. Please include the old address.



Here's what micarta® LAMINATED PLASTICS is doing for automobile engines!

A leading automobile manufacturer wanted a timing gear that was slow-wearing, silent in operation, low in cost. Now, more than six million MICARTA timing gears are performing efficiently in engines.

What can Micarta do for you?

Your problem may be as simple as noise control, or electrical insulation. Perhaps you need a material that is both light and strong, that resists corrosion, withstands vibration, heat, cold or compression. Whatever your problem, your industry, or your application, investigate the qualities of versatile MICARTA.

For prompt and complete information, fill out the coupon below.

YOU CAN BE SURE...IF IT'S Westinghouse

micarta is basic!

Westinghouse Electric Corporation
MICARTA Division, Trafford, Pa.
Attention: L. A. Pedley
Sir: (Please check one)
☐ Please have your representative call
☐ Please send me the complete facts on MICARTA
Name_____ Company_____
Address_____
City_____ Zone___ State_____
J-06511-A

quick to stick no need to lick!

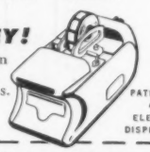
AVERY Kum-Kleen self-adhesive LABELS

THE EASIEST AND MOST ECONOMICAL LABEL YOU CAN USE!

- TRADEMARKS
- GUARANTEES
- NAMEPLATES
- DIAGRAMS
- APPROVAL SEALS
- INSTRUCTIONS
- "BUY" FEATURES
- WARNING
- INSPECTION
- PRICES

SAVE YOU TIME - MONEY!

An Avery label specialist will gladly explain how you can use Kum-Kleen pressure-sensitive labels profitably in YOUR business. Mail the coupon now for complete facts.



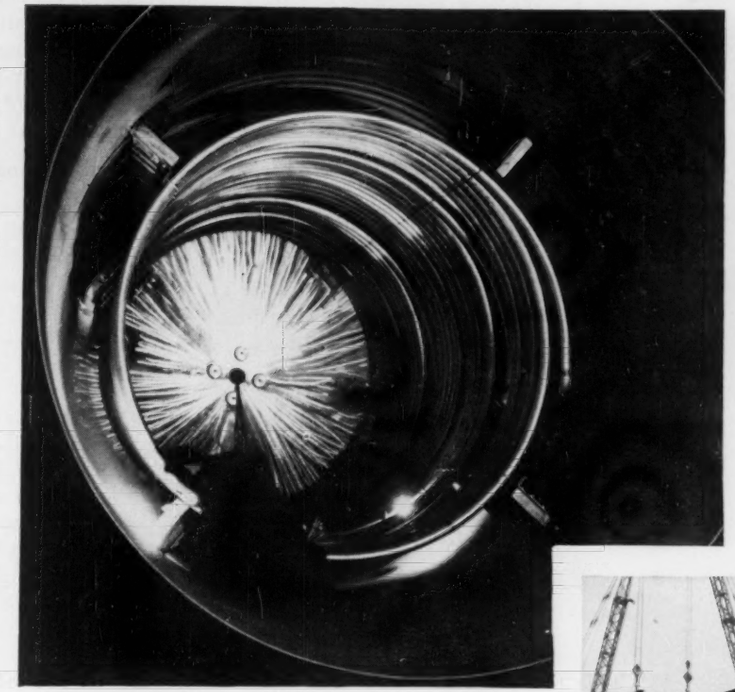
PATENTED AVERY ELECTRIC DISPENSER

AVERY ADHESIVE LABEL CORPORATION
117 Liberty St., New York 6 • 1616 S. California Ave., Monrovia, Cal.
608 S. Dearborn St., Chicago 5 • Offices in other principal cities

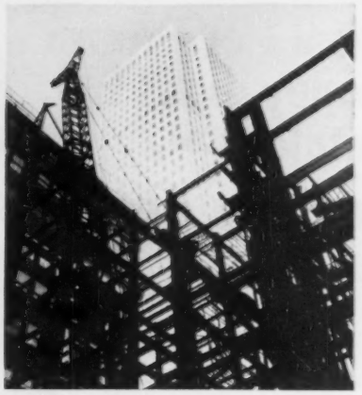
☐ Please send case histories and samples
☐ Tell us about your electric label dispenser
☐ Have the local Avery man call

Name_____
Title_____
Company_____
Address_____

Only STEEL can do so many jobs so well



Going around in circles. Here you see a huge coil of stainless steel tubing being welded in a 15,000-gallon, stainless steel vessel which will be used by a leading pharmaceutical maker for the fermentation of penicillin. Corrosion-resistant, sanitary U·S·S Stainless Steel proves an ideal metal for a thousand vital jobs in almost every industry. Only steel can do so many jobs so well.



Early skyscraper says goodbye. Pittsburgh's Carnegie Building, built in 1895, was one of America's very first skyscrapers. When it was recently dismantled, practically all of its structural steel framework was found to be in reusable condition . . . convincing evidence that U·S·S Structural Steel provides a strong, durable backbone for any building.

Up she goes! When this final span of a new pedestrian overpass for the Romona Freeway in Los Angeles was ready to be erected, the busy Freeway was closed to traffic for 2 hours. This huge 136-foot section was hauled to the site by truck, then lifted by three cranes onto the concrete buttresses. United States Steel fabricated and erected it.

Transporter for "Atomic Cannon." Designed to transport the Army's new 280 mm. gun, the T-10 Transporter is 84 feet long, yet can make right angle turns at city street corners where streets are only 28 feet wide. With its two independently-powered tractors, it can move forward, backward or sideways. The generator-powered gun, the Army's largest caliber artillery piece having complete mobility, will fire either conventional or atomic shells. U.S. Steel furnishes carbon steel and a special alloy carriage steel for this equipment.

For further information on any product shown in this advertisement, write United States Steel, 525 William Penn Place, Pittsburgh, Pa.

MANUFACTURED FROM USS STEEL UNITED STATES STEEL

UNITED STATES STEEL

This trade-mark is your guide to quality steel

AMERICAN BRIDGE . . AMERICAN STEEL & WIRE and CYCLONE FENCE . . COLUMBIA-GENEVA STEEL . . CONSOLIDATED WESTERN STEEL . . GERRARD STEEL STRAPPING . . NATIONAL TUBE
OIL WELL SUPPLY . . TENNESSEE COAL & IRON . . UNITED STATES STEEL PRODUCTS . . UNITED STATES STEEL SUPPLY . *Divisions of* UNITED STATES STEEL CORPORATION, PITTSBURGH
GUNNISON HOMES, INC. • UNION SUPPLY COMPANY • UNITED STATES STEEL EXPORT COMPANY • UNIVERSAL ATLAS CEMENT COMPANY

HEINN'S Sales Tip for You...

Big Money Goes into Catalogs— *Be Sure You Get Big Returns*

According to one authoritative estimate, American industry last year spent nearly $113,000,000 on catalogs —about 15% of the total for all industrial advertising. If your own catalog represents major expense, hard-headed sales sense dictates that you make it justify its cost. One *sure* way is to put Heinn experience on your catalog job. Thousands of other executives have done so . . . with results that prove the assertion: *lowest operational cost per unit per year.*

HEINN
MILWAUKEE

Originators of the Loose-Leaf System of Cataloging

THE HEINN COMPANY
310 W. Florida St., Milwaukee 4, Wis.

Mail This Coupon

Information, please.

- ☐ Catalog Covers
- ☐ Proposal Covers
- ☐ Easel Presentations
- ☐ Salesmen's Carry-Cases
- ☐ Price and Parts Books
- ☐ Acetate Envelopes
- ☐ Sales and Instruction Manuals
- ☐ Salesmen's Binders
- ☐ Plastic Tab Indexes
- ☐ Sales-Pacs

NAME _____ TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____

sumers, as based on the tabulated findings. The Dodge Division will then be in a position to capitalize on the preferred colors in their new line, ahead of competition.

We have established recently a fact of vital importance. Smart and attractive merchandise sells easier and at a better price than merchandise which is just useful. Thus color correctly chosen and applied affords an escape from losing the competitive race against other products which are no sturdier or no more functional, but which have gained eye appeal through proper lighting, coloring, and designing. Lack of facts, more than poor judgment and faulty taste, causes mistakes in color, design, and illumination.

Colors for Home

One of our color research jobs is that for *House & Garden* which resulted in the code of New Colors developed annually by the magazine for the home furnishing field. The need was apparent, since manufacturers wanted to eliminate needless and profitless colors in their lines, and to know in advance which of the 11,000 different colors that have been developed by chemists and color researchers in the last 20 years would sell best each year when applied to radios, tableware, paints, textiles, and other products. It was further set up to make color-matching of home furnishings easier for the housewife by providing the wanted colors in all the various types of products.

We conduct a consumer preference survey among home furnishings shoppers in leading department stores from coast to coast. Data are compiled on the basis of the facts which these surveys develop, as to which colors buyers prefer, colors they might have as well as colors already available. The findings enable us to formulate a group of colors attuned to consumer trends, and in some cases to help set those trends. Each year the current *House & Garden* colors are promoted by 500 department stores, 2,000 home furnishings, specialty, and hardware stores, 5,000 retail paint stores, and by a long list of major manufacturers.

"Now how are you at telling time?"

Yearly Changes

The results have been successful beyond all expectations. They have shown that the American buyer has "come of age" color-wise, and that his preferences change sharply from year to year. Manufacturers and merchants cannot ignore such changing demands.

There was never a time in all history when the force of good design, color, and illumination meant more to the manufacturers of present and future products—and their dealers—than to-day. Every modern advance creates new problems to be solved. A color scheme for packaging which has established eye appeal on the store counter is suddenly nullified when it appears on a TV screen. Readjustment of the colors, perhaps restyling, perhaps new lettering to "carry" under the TV lights and retain its visibility on the screens in millions of homes, all these are problems that can be solved.

THE END

HOW TO USE SOME OF THE NEW *HOUSE & GARDEN* COLORS IN COMBINATION

GOOD COMBINATIONS

1. Dresden blue and Siamese pink
2. Spruce and sand
3. Citron and dove grey
4. Dove grey and bitter green
5. Mocha and clover pink
6. Persimmon and antique white
7. Bitter green and green olive

FAIR COMBINATIONS

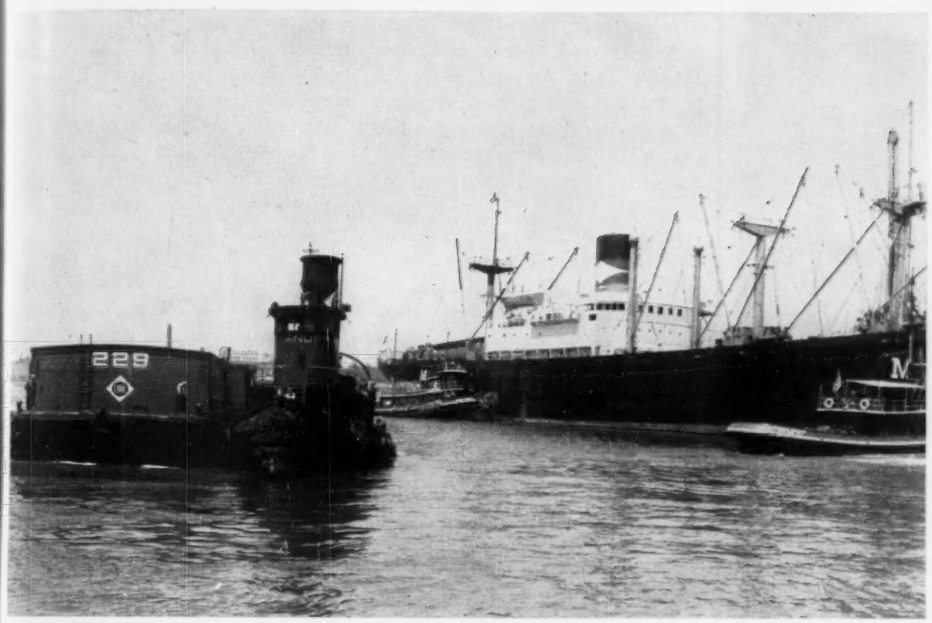
1. Wisteria and Dresden blue
2. Emerald green and suede brown
3. Flame and gunmetal
4. Green olive and terra cotta
5. Citron and middy blue
6. Carnation and antique white

POOR COMBINATIONS

1. Dark brown and nasturtium
2. Mustard and cardinal red
3. Cerulean blue and spruce
4. Hot chocolate and gunmetal
5. Green olive and Siamese pink
6. Dark brown and emerald green

IN REBUTTAL

other views from business men on the "Debate-in-Print"



WARD ALLAN HOWE PHOTOGRAPH

SHOULD U.S. TARIFFS BE LOWERED ON MANUFACTURED PRODUCTS?

The debate started in the May number of "Modern Industry" when John S. Coleman, President of the Burroughs Adding Machine Company wrote in favor of lower tariffs and H. Wickliffe Rose, President of the American Tariff League, argued against a reduction. The editors' mail was heavy with letters supporting both sides of the controversy; here are some selections.

JOHN L. COLLYER
President, the B. F. Goodrich Co.

Certainly, economically and politically sound long-range solutions must be found to the serious problems existing as a result of imbalances in import-export relationships over the World. It is not feasible for United States taxpayers to continue indefinitely the post-war practise of subsidizing trade deficits of foreign nations with the dollar area, nor is it in our self interest, in the present state of World tensions, for our Nation to ignore the trade problems and difficulties of our allies and other friendly powers.

The problem of bringing into balance our credit and debit position with the rest of the World, through increased imports and increased private United States investments abroad, is dependent on many complex factors. Obviously, time will be required to achieve a balance which will be fair and equitable.

Over the years, sizable reductions have been made in United States tariffs under the Reciprocal Trade Act. An extension of this legislation seems to be in order. To assume, however, that substantial reductions of United States tariffs on imports, repeal of the "Buy America" Act, simplification of our customs regulations and the like, is the whole, or even a substantial part of the solution of the problem is greatly to oversimplify its complexities.

Nations that would expect to benefit from tariff reductions and enactments by the United States would want to see that their domestic economies were in reasonable order. Attention would have to be given to such fundamental problems as the balancing of their national governmental budgets, since, otherwise, inflationary conditions would be fostered that would lead to lower international valuations of their national currencies. Attention would also have to be given to existing restrictive business practises and to revision or removal of many varying local restrictions on area and World trade.

Because of these complexities and others that surround the whole problem of attaining broad scale convertibility of currencies and the balancing of international trade, it seems to me that consideration and discussion of the problem and possible solutions should be directed toward the entire area of fundamentals, and not simply toward the part of the problem represented by present United States tariff policy.

EDGAR K. ORR
President, Edgar S. Kiefer Tanning Co.

I am what some people might call a "Free Trader"; I believe very strongly that free trade is essential to strengthen the economic systems throughout the free world. The United States must be the leader in lowering tariffs so as to set an example for other countries of the world, and also because ours is the only country with an economy that will allow such concessions.

I was fortunate this year in being Chairman of a committee of the Grand Rapids Chamber of Commerce which devoted considerable time to a study of problems pertaining to World Trade. The committee came to the conclusion that the Reciprocal Trade Agreements Act should be extended as requested by President

Security of Unit-Pack Assured

Through the magic of Signode Steel Strapping Unitizing Methods!

Here you see how 160 units, formerly packaged in many containers, were packed on ONE easily handled pallet-pack—the adaption by Signode of a *basic* unitizing method—to save containers, man power, and time, and to prevent pilferage!

The chances are that your products, entirely or in part, can be handled and shipped more economically and securely by applying the principles of a *basic* unit-pack method. Why not find out now? Ask to have a Signode fieldman call.

Write Signode Steel Strapping Co., 2665 N. Western Ave., Chicago 47, Ill. Offices coast to coast. In Canada: Canadian Steel Strapping Co., Ltd. Foreign subsidiaries and distributors worldwide.

SIGNODE Steel Strapping Co.

SEND FOR FOLDER SHOWING 6 BASIC WAYS OF UNITIZING

continued

Eisenhower. We felt the Buy American Act to some extent was favorable, but Congress should give more latitude to the executive branch of the Government in the administration of this problem. In principle we were opposed to quota restrictions; however, it was our recommendation that quotas be removed progressively. It was unanimously agreed that the Smoot-Hawley Tariff Act of 1930 should be repealed and entirely replaced by a new tariff act. It was also felt that a Customs Simplification bill should be approved and passed by Congress.

In July 1952, former President Truman requested that the Public Advisory Board for Mutual Security appoint a committee to study the entire problem of "United States Trade and Tariff Policy." The "Bell Report" which resulted from this committee's efforts warned that if this country does not take measures to facilitate an increase in imports, United States exports will decline and American Industry and Agriculture will be seriously affected. Certain trade policies of our Nation conflict with our foreign policies, thereby weakening the leadership of the United States while at the same time threatening the strength of the free world.

In his arguments against lowering tariffs, Mr. H. Wickliffe Rose asked the question "How could the abolishing of all our customs duties offset the vast gap between the financial level in our economy and the rest of the world?" My answer to this is that by lowering tariffs we would allow other countries to earn American dollars and thereby increase their economic level. The United States considers this vitally important by the fact that it instigated the Marshall Plan. By allowing these other countries to trade freely, the gap between the United States economy and the rest of the world would soon narrow.

Mr. Rose also points out that our production would be lowered if tariffs were removed. I would like to ask this question. If the entire world was a market for American goods, would it not be necessary for our production to expand to meet the tremendous demand?

In answering the old argument that American workers would be competing with lower paid workers in other countries, I would merely like to state an economic fact that productivity is the proper measure of the standard of living of any country, and the productivity in the United States is far above all others. The same argument was raised at the time of the industrial revolution, but we all know that machines and labor saving devices eventually created new jobs.

According to the "Bell Report" our imports in 1951 totaled $10.8 billions. The report estimates that if tariffs were reformed the imports would rise to $11.8 billions, and if there were no tariffs they might rise to $12.6 billions. If these estimates prove to be correct, we would soon narrow the gap between exports and imports; our yearly average of United States exports from 1951 to 1953 was $13.2 billions.

The lowering of tariffs would affect my company and the entire leather industry as much as, or more than, any other industry in this country. Regardless of this, I feel that business men particularly must fight for the lowering of tariffs because they should always consider the welfare of the United States and the rest of the world rather than judge the effect upon their particular business.

E. V. GUMPERT

Export Manager, Harley-Davidson Motor Co.

Most of the free traders in this country, or advocates of freer trade, are big-scale manufacturers like John Coleman, Henry Ford II, and others. Years ago, when those firms were relatively infants, they were in favor of high protective tariffs and in many instances those high tariffs were responsible for the growing up of these infant industries. Now they are large, powerful firms. Many of them have overseas plants. They have a firm grip on the American market and they are in favor of free trade because they believe that free trade will enable them to increase their exports. In other words, they are not afraid of low cost competition from other countries. They feel strong enough to meet it in the home market and

continued

they want increased exports besides.

American firms that are in favor of legislation that will give them relief from excessive imports are referred to as isolationists, protectionists, selfish interests, and so forth. However, the free traders who are willing to sacrifice any other American industry in the hope that they will be able to increase their exports are pictured as loyal American citizens, patriotic, looking after the welfare of the world.

The gap between our exports and our imports varies anywhere from $5 billion to practically nothing, depending upon whose figures are used. Roughly, our exports amounted to $15 billion and our imports to $10 billion, so that it looks as though we have a $5 billion gap. In our exports, however, government statistics included all of the materials that we gave away and they were paid for by this country. They were not true exports because they did not represent merchandise that the European countries had to pay for in dollars. They did not therefore rightfully belong in our export statistics.

In addition to this, we actually gave the European countries cold cash which is the equivalent of buying from them. As a matter of fact, it is even better than buying from them because they have to give nothing in return, but these grants represent dollars that they can use in paying for exports from this country.

We also placed offshore contracts for possibly a billion dollars worth of defense products and the European countries received dollars on those contracts.

For this reason, the apparent $5 billion gap between our exports and our imports can very easily be whittled down to practically no gap. It all depends upon whose figures you use.

Free traders naturally use the $5 billion gap and they say that we can easily increase imports by $5 billion. Most raw materials are brought into this country free of duty and it is reasonable to assume that we are already importing as many raw materials as we can absorb. The $5 billion increase in imports, therefore, would consist mainly of manufactured goods and principally of the same type of manufactured goods as are already produced in this country.

Isn't it reasonable to suppose that if there has been an additional potential market for $5 billion worth of merchandise of the type made in the United States, American manufacturers would years ago have expanded their productive capacity to fill that demand? Not having done so is an indication that the demand does not exist. Consequently, if $5 billion worth of additional merchandise is brought into this country it will mean that American manufacturers will make billions of dollars less of these commodities, which in turn will mean closing the factory doors and the loss of jobs to thousands and thousands of men.

Free trade is a problem that is far greater than any individual American industry or manufacturer. Free trade will wreck the American economy and if we go to free trade we will learn the hard way that the American market cannot absorb manufactured goods without limit.

J. L. WELLER
Vice-President, Trans-World Air Lines, Inc.

The arguments for freedom of trade between nations are as compelling as those for freedom of trade within our own frontiers. For the world's most productive nation —and at the same time its greatest creditor—a policy of protectionism is illogical; when this is carried to the extreme of subsidizing exports to avoid admitting imports the policy becomes absurd.

One point not mentioned in the exchange between Mr. Coleman and Mr. Rose is the effect of protectionism on our customs revenue, at one time the major support of the Federal Government. Present customs duties in most cases have been established with a view to discouraging the traffic rather than producing revenue.

There appears to be little doubt that tariffs at a generally lower level would produce greater revenue, thereby permitting some relief from

How to make 150 containers disappear

Another example of packaging magic that couldn't be performed without Signode Steel Strapping!

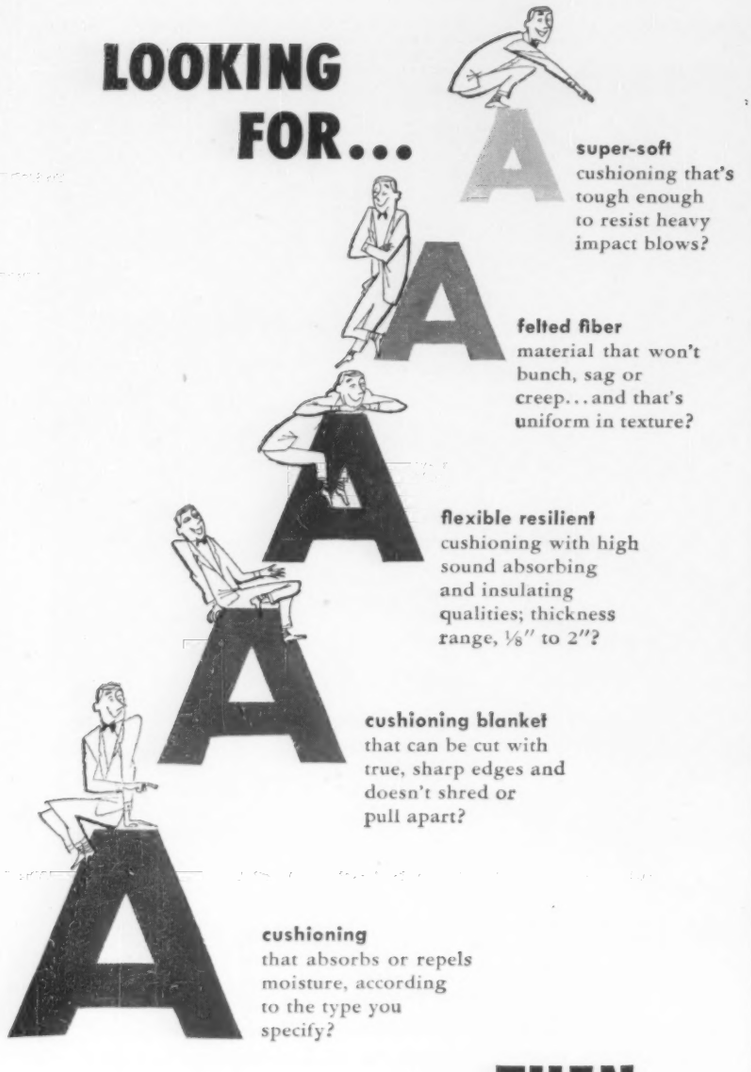
The pallet load shown here contains 150 sub-assemblies, nested on returnable wooden trays, packaged for easy handling and shipping by strong bands of tensioned Signode Steel Strapping.

This method of packaging eliminated the use of 150 individual containers, and the materials needed to pack and seal them. Units were handled *once*—at the assembly line, where they were placed on the trays. Strapped to the pallet base, which also served as a tray, the trays became a single, pilfer-proof unit, easily handled by *one* man and a fork truck!

If you now ship by pallet or have products which can be shipped that way, and the economies apparent in this method of product packaging, handling and protection interest you, we will gladly supply detailed facts. Write Signode Steel Strapping Co., 2665 N. Western Ave., Chicago 47, Ill. Offices coast to coast. In Canada: Canadian Steel Strapping Co., Ltd. Foreign subsidiaries and distributors world-wide.

SIGNODE Steel Strapping Co.

SEND FOR FOLDER SHOWING 6 BASIC WAYS OF UNITIZING


LOOKING FOR...
super-soft cushioning that's tough enough to resist heavy impact blows?
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Company.....
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continued

the high personal and corporate income tax rates, which also have been raised beyond the point of diminishing returns.

SPRUILLE BRADEN
New York City

I am constrained to agree with the "YES" answer to the question, "Should the United States Lower Tariffs on Manufactured Products?" My reason is that ever since I was a young man, I have felt that, in the final analysis, everything that comes into this country increases our wealth by just that much; whereas everything shipped out diminishes our wealth. Therefore, it all depends on what we give or get for these shipments. So great is my confidence in the acumen and trading abilities of American business men, that I am convinced that, with few exceptions, we will be able to get our money's worth in both directions. In other words, that these trades may be carried on profitably for us as well as for the other side.

Where, in some few cases, for reasons of defense or otherwise, it is necessary to maintain a particular type of enterprise, for instance, watchmaking, in order to have in this country a corps of skilled workers, I feel we should frankly face the facts and give to that industry the necessary support, charging it up to defense or whatever may be the real reason, but not hiding it away under a protective tariff.

W. A. MENNE
President, German Association of the Chemical Industry
Dusseldorf, Germany

Western Germany was able to export in 1952 goods valued at roughly $250 million to the United States, whereas imports from the United States amounted to approximately $625 million. The deficit in our trade with the United States, therefore, amounted to more than $375 million last year. The German Federal Republic therewith had to cope with the highest dollar deficit of all Western European countries.

As against domestic production in the United States of $1000, German shipments to the United States accounted for less than $1 in 1952. The German deficit in her trade with the United States could quickly be eliminated, if we could succeed in increasing our exports to 2 per mille of the American gross national product. In view of the size of the American market and its enormous purchasing power, hardly anybody will be able to claim seriously that such an increase constitutes a danger to the American domestic market or the production of certain branches of industry. Compared with the volume of production of the United States, such an increase in imports would hardly carry great weight for the United States, whereas it would help us to solve a problem which is of vital importance.

CHARLES J. WALSH
Associate Professor of Economics, Fordham University

The tariff issue may be one of the decisive issues of our age. Stalin —in his last major theoretical work, the "Economic Problems of Socialism"—predicted that trade would be the rock on which the free world will founder.

Personally, I believe (with Mr. Coleman) that American trade barriers should be drastically reduced. The answers to the problem of the free world must be found in expansion. The United States, as the economic dynamo of the free world, must supply the energy to power the needed expansion of production and trade. A huge American import market is needed to provide the centripetal force which will hold the free world together.

I am convinced that both industry and labor have everything to gain and nothing to lose through such a policy. In an expanding world there are market opportunities and employment for everybody. It is restriction which destroys employment and business opportunity.

Mr. Rose's position is typical of those who favor increased protection. He doesn't argue the case on its merits. Instead, he sets up a number of irrelevant strawmen and then proceeds to demolish them with great sound and fury.

Let's have a look at a few of these strawmen. First, he says, the Re-

continued

ciprocal Trade Agreements Act is a failure. Why? Why, because it didn't—all by itself—eliminate unemployment in the '30's; it didn't prevent World War II; it didn't immediately restore multilateral trade after the War.

The Reciprocal Trade Agreements Act, and the American program for liberalizing trade, were never designed to cure all the ills of man and beast. Mr. Rose is a medicine man in reverse. Because a policy won't cure all—everything—he wants it rejected. That it will help doesn't make any difference; it must cure all.

His second argument is made of the same stuff. Even if tariffs were entirely eliminated, says Mr. Rose, foreign nations still wouldn't be able to balance their accounts—to pay their own way. So what is his conclusion? Keep the tariffs and make it still tougher. This logic is a little difficult to follow. It's like a man refusing to take medical treatment on the ground that, while it would help, it wouldn't *cure all*.

There is no sovereign specific for all the problems—economic and political—which confront the world. Correction of difficulties must be partial and slow. Economies cannot be reconstructed overnight. As Mr. Coleman pointed out in his case for tariff liberalization, "There are no single or simple solutions to the persistent problems of world economic stability. But it is urgent that we move forward on a broad front and that that movement be sustained."

Tariff reduction is one (but only one) of the measures necessary to develop the dynamic, expanding economy which is essential to the security and prosperity of the free world. Let's not let narrow selfish interests short-circuit this development and throw the game to the Soviet Union by default.

L. E. WHITAKER
The B. F. Nelson Manufacturing Company

Thinking very much as Mr. Rose does, I can see no merit in doing anything with tariffs other than to make whatever adjustments may seem wise, keeping in mind that regardless of all words and window dressing, we have to compete with much lower wage rates.

We have competed very well so long as our economy has resulted in improved methods and equipment being available to us to a greater extent than abroad. A time when we are giving freely of our knowledge, and also giving, or selling equipment abroad is no time to let the tariff bars down.

The assumption that the increased output of our friends and neighbors has to be sold here (for more than a relatively short time) does not make sense. Sure, we are the largest *developed* market for their goods, but the rest of the world has a much larger potential market. I see no reason to give away our already developed markets in lines that we can and have been supplying as against expecting other countries to develop their own markets—with any help that we can give them which carries no threat of hurting our own economic balance.

C. H. PERCY
President, Bell & Howell Co.

Mr. Coleman's very forceful arguments lead to the almost inescapable conclusion that while freer trade will pose some serious short-term problems, it would also bring American worker-consumers a number of long-range tangible benefits. Among them, higher *real* wages and a more peaceful, secure world.

CARTER C. HIGGINS
President, Worcester Pressed Steel Company

Our tariff schedules on manufactured products do not recognize the post-war world. Our America has ideas to export and protectionism is not one of them.

We say to other nations, "Be productive and you can fight communism with something better. Build your exports." Then, as they grow stronger, our tariffs and regulations block their products because we cannot compete. They begin to wonder about selling to a receptive Soviet bloc. . . . The greatest opportunities lie in lower tariffs on manufactures.

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To the Operator

with ROL-DEX* by Watson—

Modern Card Trays on Rollers!"

*from a recent Modern Design issue of Baltimore and Ohio Magazine, published by the Baltimore and Ohio Railroad.

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Production per worker increases 25 to 55% with ROL-DEX by Watson, the modern method of housing records. At finger-tip touch records *roll to the seated operator.* Units are custom built for both large and small quantities of records. ROL-DEX pays for itself by increasing production and saving up to 45% in record keeping costs. Investigate ROL-DEX now.

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Please send me information about ROL-DEX rolling units.

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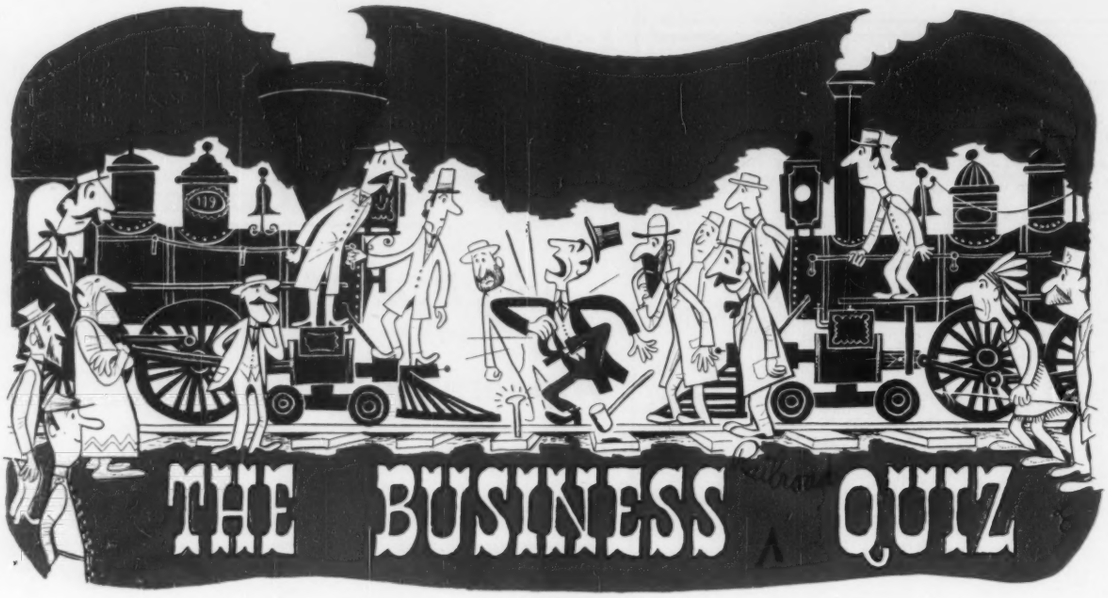
Watson also builds a complete line of filing cabinets and courthouse, bank and hospital equipment.



JOHN DREXLER

Associate Editor

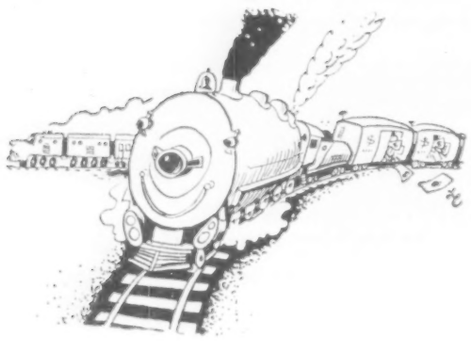
Clear the track and pay heed to the red-eye—here's a quiz to help you discover how much you know about the "iron road." Score yourself as follows: Over 70—you're a veritable Casey Jones; under 40—you'd better consult your small son or some other knowledgeable source. Answers will be found on page 200.

1. Railways are classed I, II, or III, according to their operating revenue for the year. A Class I railroad is one whose operating revenue is at least:

☐ $5 million ☐ $1 million
☐ $2.5 million ☐ $500,000

2. The railroads derive what average amount of their operating revenue from freight charges?

☐ 63 per cent ☐ 83 per cent
☐ 73 per cent ☐ 93 per cent



3. In 1952, railroad freight charges were increased by an average of 7.6 per cent over 1951 levels. By what percentage are current rates above those of ten years ago?

☐ 85 per cent ☐ 63 per cent
☐ 74 per cent ☐ 52 per cent

4. Many railroads are well-known by their initials or slogans. Can you identify each of the following? (One point for each correct answer.)

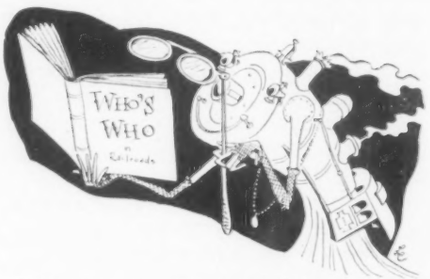
a) The Soo Line .....
b) The D. & H. .....
c) Through the Heart of the South .....
d) The B. & O. .....
e) Route of the Zephyrs .....
f) The C. & O. .....
g) Main Street of the Northwest .....
h) The Route of Phoebe Snow .....
i) Katie .....
j) Route of the Black Diamond .....

5. The weight of a freight carload varies with the commodity. What was the average of a freight carload in 1951?

☐ 35 tons ☐ 42 tons
☐ 38 tons ☐ 47 tons

6. The approximate number of stockholders and bondholders with direct financial interest in the railroads of the United States is placed at:

☐ 1.5 million ☐ 2.5 million
☐ 2 million ☐ 3 million



7. Can you associate each of the ten famous trains listed on the left with one of the railroads listed on the right? (One point for each correct answer.)

a. Golden State	( ) 1. New York Central
b. The Chief	( ) 2. Union Pacific
c. Twentieth Century Ltd.	( ) 3. Southern
d. City of Denver	( ) 4. Missouri Pacific
e. Congressional Ltd.	( ) 5. Atchison, Topeka & Santa Fe
f. Silver Star	( ) 6. Chicago, Rock Island & Pacific
g. Capitol Ltd.	( ) 7. Pennsylvania
h. Empire Builder	( ) 8. Baltimore & Ohio
i. The Crescent	( ) 9. Seaboard
j. Colorado Eagle	( ) 10. Great Northern

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The following Canadian firms seek direct contacts in the U.S.A. They can: • Manufacture your products in Canada . . . • Exchange manufacturing rights . . . • Purchase parts to complete production . . . • Import and distribute your goods . . . • Act as factory representatives . . . • Sell Canadian products to U. S. buyers . . . or . . . • Render professional services.

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MEMO
When you don't buy your trucks, you don't buy the headaches of procurement, maintenance, tied-up capital. You don't buy garage space, insurance, licenses, bookkeeping or other countless confusions of truck ownership. Yet you always have a clean truck, your size, with your name . . . everything supplied but the driver!
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TRUCK LEASING SYSTEM
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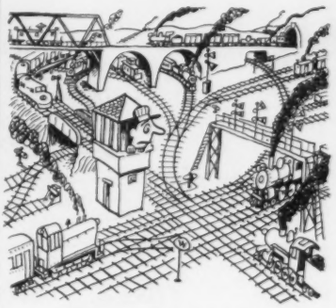
CHICAGO 4, ILLINOIS
Members in principal cities
ReLEASE invested capital!
Send for bulletin D-6
YOUR NAME

8. The over-all operating revenue of the nation's railroads in 1952 as compared with 1951:

- ☐ increased
- ☐ 2 per cent
- ☐ 3 per cent
- ☐ 4 per cent
- ☐ 5 per cent
- ☐ decreased

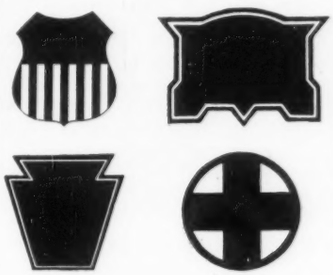


9. The opening and settlement of the West heralded an expansion of the nation's railroads and with the expansion came a gradual shift in the center of railroad density. In 1951 which of these States had the greatest mileage of track per square mile?

- ☐ Ohio
- ☐ Illinois
- ☐ Pennsylvania
- ☐ Iowa

MONKMEYER PHOTOGRAPH

10. Here are four famous insignia of railroads. To which company does each belong? (Two and one-half points for each correct answer.)



Whew! Look at my ADDO-X go!

You're so right, of course. And go it will with smoothness and accuracy that'll really make your work fly. It's a beauty and it'll stand up, too . . . thanks to superior design and precision manufacturing.

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makes the ADDO-X a calculator *as well* . . . when used for multiplication. This exclusive feature permits automatic step-over to the next higher unit without using the O-Key. Here's a time saver that really insures fast and efficient multiplication. This feature combined with ADDO-X's "live" Repeat and Repeat/Subtract Key . . . **plus** *automatic clearance* of the Keyboard after multiplication . . . makes ADDO-X the most advanced adding machine on the market. Write for new, illustrated folder and full details, today!

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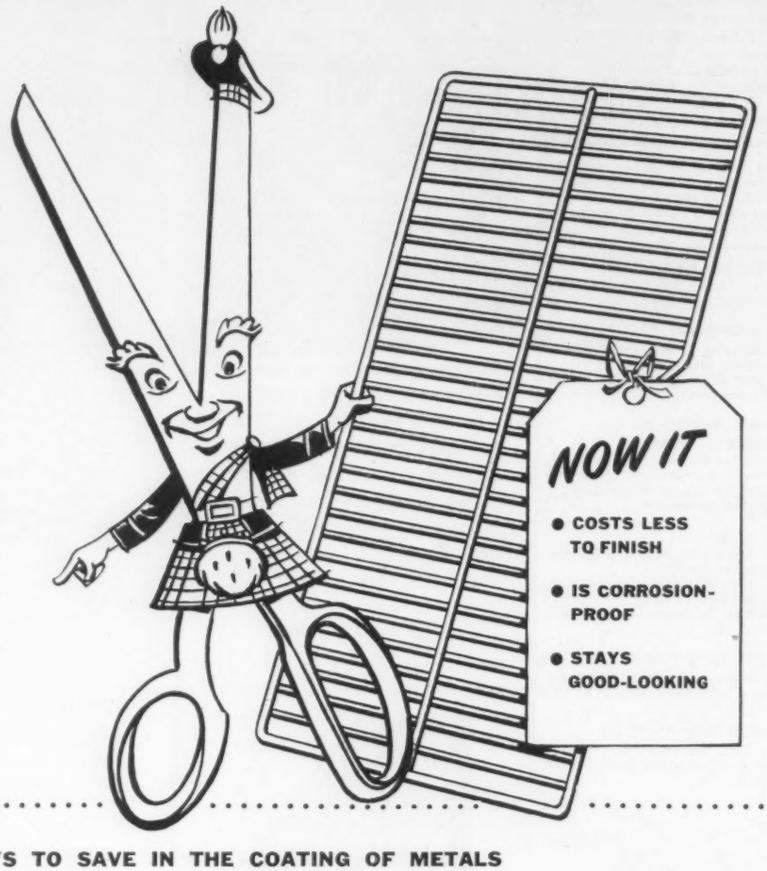
THIS mid-west refrigerator maker was having trouble with the clear enamel used to coat chromium plated refrigerator shelves to prevent rusting at the welds. The coating had poor resistance to wear. Sliding dishes and handling wore off the coating at spots – making the shelves unsightly.

Bringing into play United Chromium's long and diversified experience with both organic and plated finishes, "The Unichrome Man" recommended a Clear Enamel *developed especially for chromium* to seal it against corrosion.

Results: With just a single application, this Unichrome Enamel gave *double* former film thickness of a coating that could take abuse. Both corrosion and wear were licked. And despite the thicker coating a $15,000 yearly saving on material costs.



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40% saved on material.

When chromate treating zinc die castings in Unichrome Dip, one automotive supplier found material costs 40% less than with former *"homemade"* solution . . . with job done as good or better.

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Here and There IN BUSINESS

WHAT'S NEW AS OBSERVED BY THE EDITORS

Partially obscured lettering indicates this United Airlines flight is not co-ed.

"For Men Only"

seems here to stay, as far as non-stop flights of United Airlines between New York and Chicago are concerned.

Recently United inaugurated *The Executive* plane with extra services designed especially for the business man. Included are closing market quotations, cigar and pipe smoking, slippers, steak dinners, arrangements for last-minute communications and messages, latest editions of newspapers and other various business magazines.

Two stewardesses will be the only women aboard the flights.

Both eastbound and westbound flights depart at five o'clock in the afternoon, allowing the business man to leave after a full working day in either of the two cities, and still arrive at his destination early in the evening.

Initial enthusiasm on the part of the public for the "men only" flights indicates that *The Executive* may become one of the famous "name" trips in travel history, according to R. E. Johnson, Vice-President and Assistant to the President of United Airlines.

During the first eight weeks of operation, a total of 4,795 passengers were carried on the eastbound and westbound flights.

High flow and fast cure,

said to be the two properties most sought after in a binder for granulated wood, are claimed as features of a new phenolic resin recently announced by the Plastics Division, Monsanto Chemical Company, Springfield, Mass.

The new product is known as Resinox 743. It is used to convert sawdust and scrap wood into new raw materials for the manufacture of toys, furniture, and housewares.

High flow allows deep penetration of the wood mass, and fast cure makes possible the savings of shorter production cycles.

"So it's your birthday"

takes on added meaning for the employees of Airborne Accessories Corporation, Hillside, N. J.

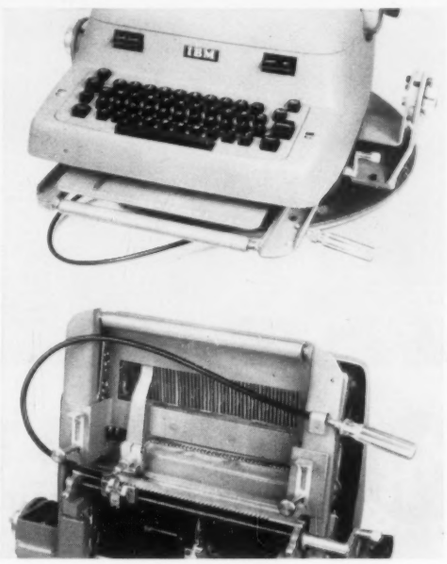
In announcing a wage increase and changes in fringe benefits, the company stated that in addition to seven paid holidays, the employees will get the day off with pay on the first and each succeeding anniversary of their employment with the company.

A "seeing-eye"

semi-automatic screwdriver has been developed by International Business Machines Corporation to speed the final adjustment of individual type bars on the electric typewriter.

The adjustment screws, located on the underside of the typewriter, control the impression of the 42 operating keys on the keyboard. In making the final adjustment a movable indicator attached to a numbered card is placed under the typewriter. Each number represents a screw.

The screwdriver bit is turned by a flexible extension shaft. Without lifting the typewriter from its normal position on the assembly line, the device is moved from one screw to the next. At the same time it finds the screw slot automatically. Moving with the screwdriver, the visible indicator on the card positions itself at the number of the screw to be adjusted.

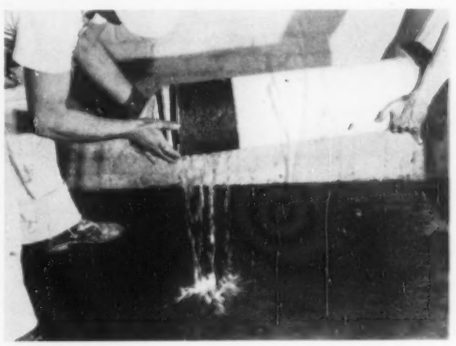


Top picture: movable indicator underneath keyboard to be adjusted. Bottom picture: screwdriver mechanism under typewriter.

Sub-microscopic particles of polystyrene

resins are the base of a new moisture-resistant and decorative coating for masonry surfaces above or below ground in commercial, industrial, and residential buildings.

These coatings also resist soap, alkali, acid and chemical fumes, as well as dirt and abrasion. A single coat properly applied is usually sufficient to cover even such absorbent surfaces as cinder block. The coating is applied by brush, roller, or spray to surfaces properly cleaned, and dries to the touch in about 30 minutes.



Water is retained by coated section of pipe; leaks freely through uncoated portion.

The coating is known as "Styrox," and can be applied to cellar walls where seepage is caused by intermittent drainage.

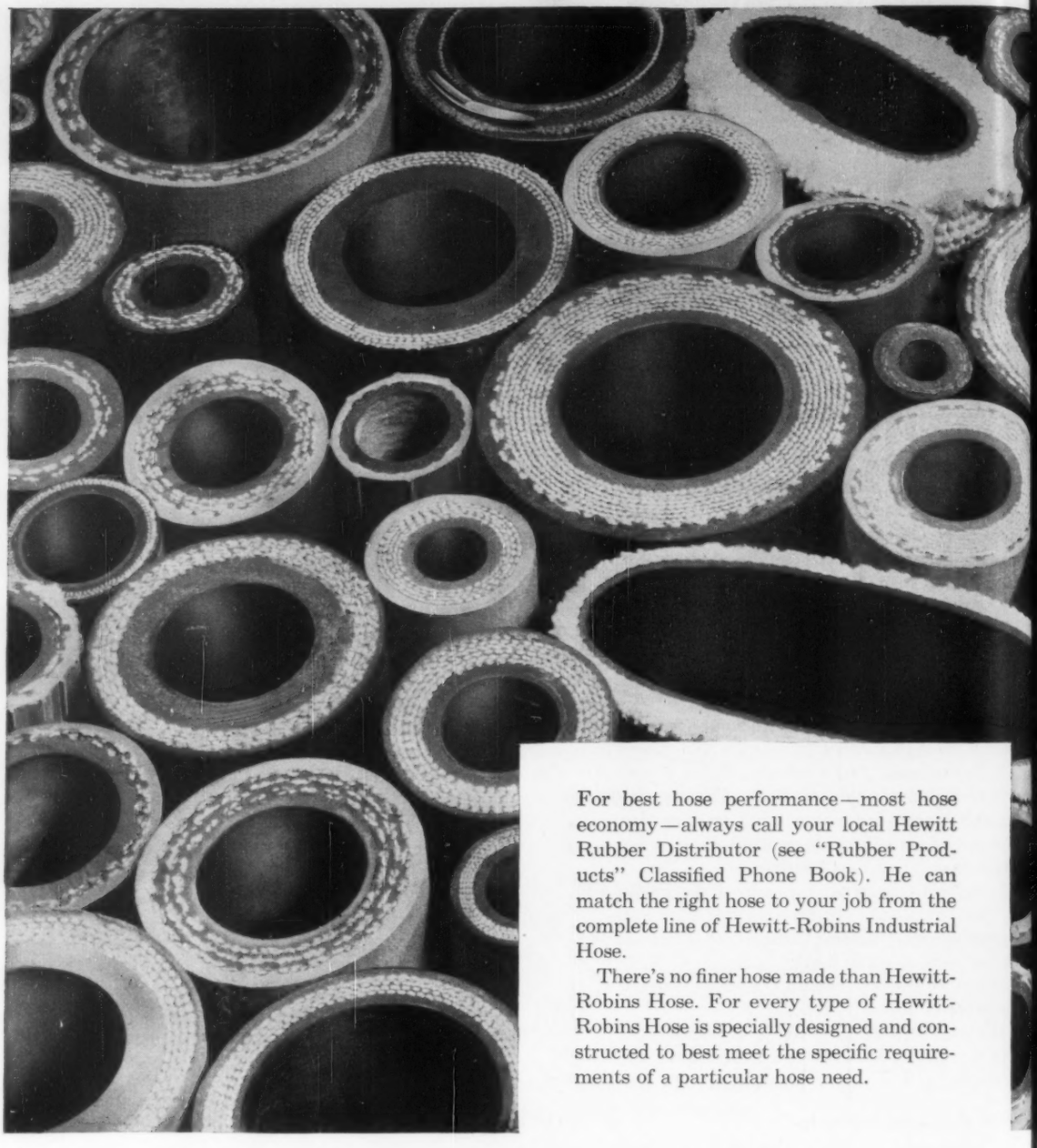
Based on Bakelite polystyrene latex, Styrox masonry coating is produced by Protex-A-Cote, Inc., Newark, N. J.

"Private Eye"

is a new portable electronic detector for locating buried metals and minerals. A simplified circuit is said to give it great sensitivity and power of penetration.

It was designed for public utilities and other

Get the Right Hose at



For best hose performance—most hose economy—always call your local Hewitt Rubber Distributor (see "Rubber Products" Classified Phone Book). He can match the right hose to your job from the complete line of Hewitt-Robins Industrial Hose.

There's no finer hose made than Hewitt-Robins Hose. For every type of Hewitt-Robins Hose is specially designed and constructed to best meet the specific requirements of a particular hose need.

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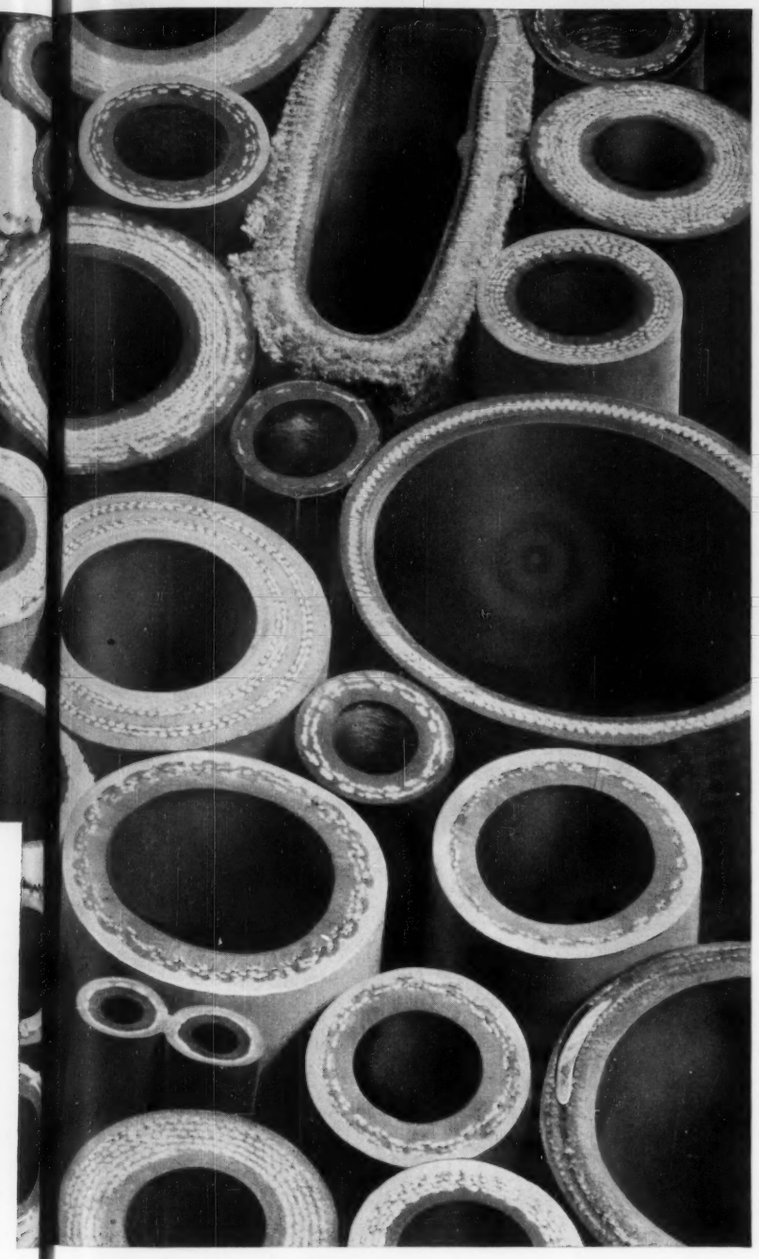

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934

Buried metals and minerals are discovered by electronic device.

companies with large underground structures. However, it can be used to survey mountains, fields, streets, walls, and any terrain where it is desirable to locate buried metals and minerals, including gold and silver.

The manufacturer adds that it can also be used by the "treasure hunter, prospector, and the beachcomber gone scientific."

The device has low voltage radio batteries and consists of a transmitter and receiver which may be folded in suitcase fashion when not in use.

A new model

of a pocket-size portable calculator has been introduced into this country. It is known as the Model 2 Curta Calculator, and is manufactured by German and Swiss technicians. Distributor is Curta Calculator Company, Chicago, Ill.

Larger model of portable calculator is being introduced in United States.

This is a "big brother" model of a portable calculator introduced into this country last year. Model 2 has a greater calculating capacity than the smaller unit. However, this has been achieved with only slight increase in weight and size.

The Model 2 calculator fits in the hand, and weighs twelve ounces. It is all-metal in construction and can be carried in a pocket or brief case for field calculations.

Gravity feed order picking

is the latest word in cased goods warehousing. Cases slide down the tilted rails and a lever at the front end of the rail is used to catch and hold the line of cases as the front one is removed. The unit is fed through the rear where a catwalk and a pallet conveyor are located. In a 50 by 100 foot area it is estimated that 1,100 items can be faced on a 100-foot-long aisle for order picking.

Grocery store methods brought to the warehouse speeds up the filling of orders and assure stock rotation.

Some advantages of the "Select-O-Mat" according to its distributor, Acme Pallet Company, Inc., 15 Park Row, New York 28, N. Y., are less labor costs and greater space saving.

Deburring machines

designed to use ground corn as a blasting medium to remove light burrs from "soft" metals such as aluminum, mild steel, and most of the non-ferrous metals, are made by Modern Industrial Engineering Company, 14230 Birwood Avenue, Detroit 4, Michigan.

Known as "Maizo Blast" machines, they operate on ordinary plant air pressure. A wheel type fixture grips the parts which are blasted by two reciprocating guns.

A micrometer checking set

for one and two inch micrometers consists of three gage blocks and two optical parallels of fused quartz. When held under monochromatic light, fringe lines on the micrometer gaging surfaces tell whether there is deviation from flatness, parallelism, or squareness.

Two different size parallels in the DoAll kit allow checking of spindle and anvil faces at each half turn.

Also included in the kit from the DoAll Company, Des Plaines, Ill., are a deburring stone, a jar of cleaning fluid, and a jar of petrolatum.

Packaged gatehouses

made of porcelain enamel and manufactured to order by Erie Enameling Company, Erie, Pa., are adapted for fast installation. One for Esso's Bayway Refinery, for example, was ready for service within 24 hours after it was shipped.

This gatehouse includes sliding windows, electric heaters, an intercommunication system, and other facilities. Others can be designed to include whatever accessories or additional equipment is needed, and with a wide color choice.

For cleaning sewers

a low cost machine called the "Sewer Master" uses a coiled spring snake with cutting tools attached to its jaws. The tools are said to remove roots, grease, chips, and other obstructions at points over 100 feet from the sewer entrance. The unit, which weighs less than 100 pounds, has a reversible motor. It's made by Oster Manufacturing Company, 2057 E. 61 Place, Cleveland 3, Ohio.

Industrial charger

for truck batteries consists of a four-circuit package unit for six-cell lead-acid or for ten-cell nickel-iron batteries for hand trucks. Four ten-foot charging cables are also included in the package as standard equipment.

The Hobart "Four-Circuit Monitor Charger" is a product of the Motor Generator Corp., Troy, Ohio.

A wide rear view

is assured the modern motorist with the production of a new automobile mirror.

The unit is wide enough to take

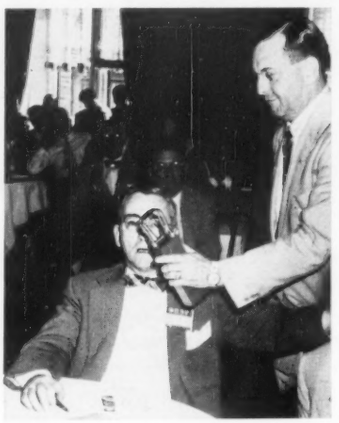
New mirror gives automobile driver full view of what goes on behind.

advantage of the car-wide rear windows of the latest models of motor cars.

The new mirror clips on the old mirror. It has been specially designed to hold steady against vibration. Construction is of polished plate filter-glass, with chromium plated frame. The mirror is a development of Skylark Automotive Corp., Culver City, Calif.

A portable radio transmitter

was used recently at an Atlantic City convention to show how a speaker may talk to his audience over a public address system from



Questions from the floor are relayed by radio to public address system.

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This "Program" Keeps the TV Industry on schedule!

How American Airfreight has improved production for leading electronic manufacturers

To keep assembly lines flowing smoothly, the nation's television industry today specifies airfreight delivery on incoming shipments from distant suppliers. Thus component parts are on hand in the factory when needed and production schedules are promptly met.

What's more, such an airfreight "program" permits more rapid introduction of set improvements—and at the same time eliminates heavy obsolescence costs on component parts that would otherwise be in stock for the discontinued models.

Speak to any of the leading electronic manufacturers—and they'll tell you that the production flexibility resulting from airfreight more than compensates for slightly higher shipping charges. For further information on what American Airfreight can do to improve your business, wire us *collect*—and we'll have a representative in your office promptly. American Airlines, Cargo Sales Division, 100 Park Ave., New York 17, N. Y.

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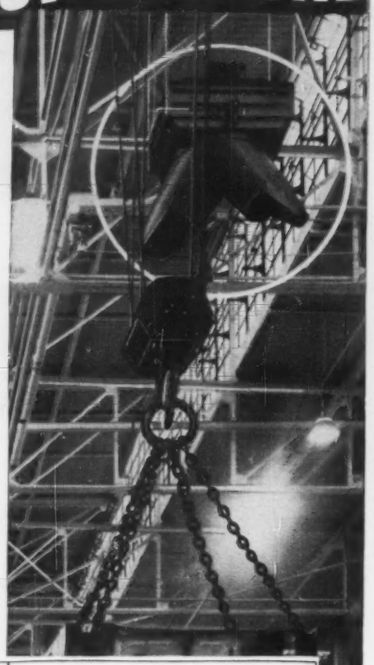
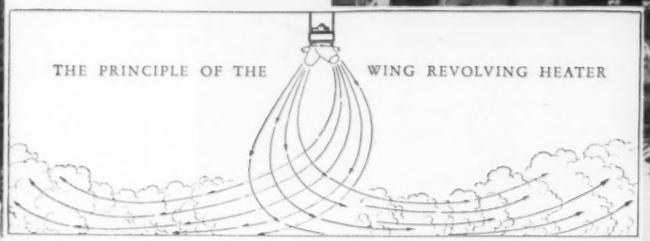
HEAT THAT MOVES AROUND

THE fact that the discharge outlets of WING Revolving Unit Heaters keep the heated air in constant, gentle motion is one of the reasons why nationally known firms like the Budd Company have installed them in their plants, both at Philadelphia and in the one shown in this photograph, at Gary, Indiana. The big blanking and forming presses in this great plant present a natural barrier to ordinary fixed discharge heating systems, but not to the moving streams of heated air from the WING Revolving Heaters, even suspended, as they must be, far above the floor, to clear the cranes. That is equally true in the summer time when, with steam turned off, the cooling breezes from the revolving discharge outlets keep workers comfortable on the hottest days. Investigate. Write for Bulletin HR-6.





The moving streams of heated air (or cooling breezes in summer) sweep slowly around through 360 degrees, covering successively every direction. The air velocity is sufficient to carry to walls, and remote corners and the constantly changing direction of flow causes the air to find its way around obstructions.

Wing

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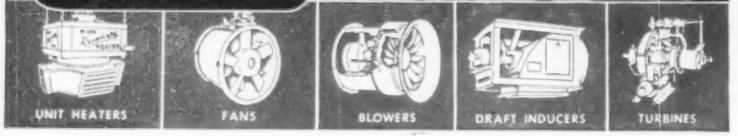

any point in and around an auditorium without carrying a wired microphone with him.

This new radio application, known as the "Handie-Talkie," is a development of the Communications and Electronics Division of Motorola, Chicago, Ill. It will communicate over distances up to two miles.

These transmitters can be passed through the audience for discussion periods, questions and answers being picked up by the public address system and relayed so that all can hear.

This floor machine weighs 38 pounds with the brush attached.

Mechanized floor maintenance

is now available at lower investment cost with the introduction of a new low-cost floor machine by the Hild Floor Machine Co., Chicago, Ill.

It has a 12½-inch brush spread and a brush speed of 210 rpm. Attachments are available to scrub, wax, polish, buff, sand, and steel-wool floors.

Cactus cushions

do need a word of explanation. However, a cushioning material made from cactus fibers is now available for lawn furniture, mattresses, and upholstery.

Thorny cactus is being turned into bouncy, shock-absorbent cushion material by Queen City Tulatex Corporation, Burlington, Vt., by spraying cactus fibers with a specially compounded natural rubber latex, called Lotol, made by the Naugatuck Chemical Division of United States Rubber Company.

Mexican cactus is used. In Mexico it is separated into strands, twisted into large "pig-tails," and steamed. In Vermont it is untwisted and sent through machines which arrange the fibers in mats. On end-

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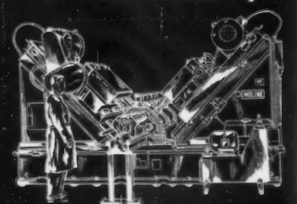
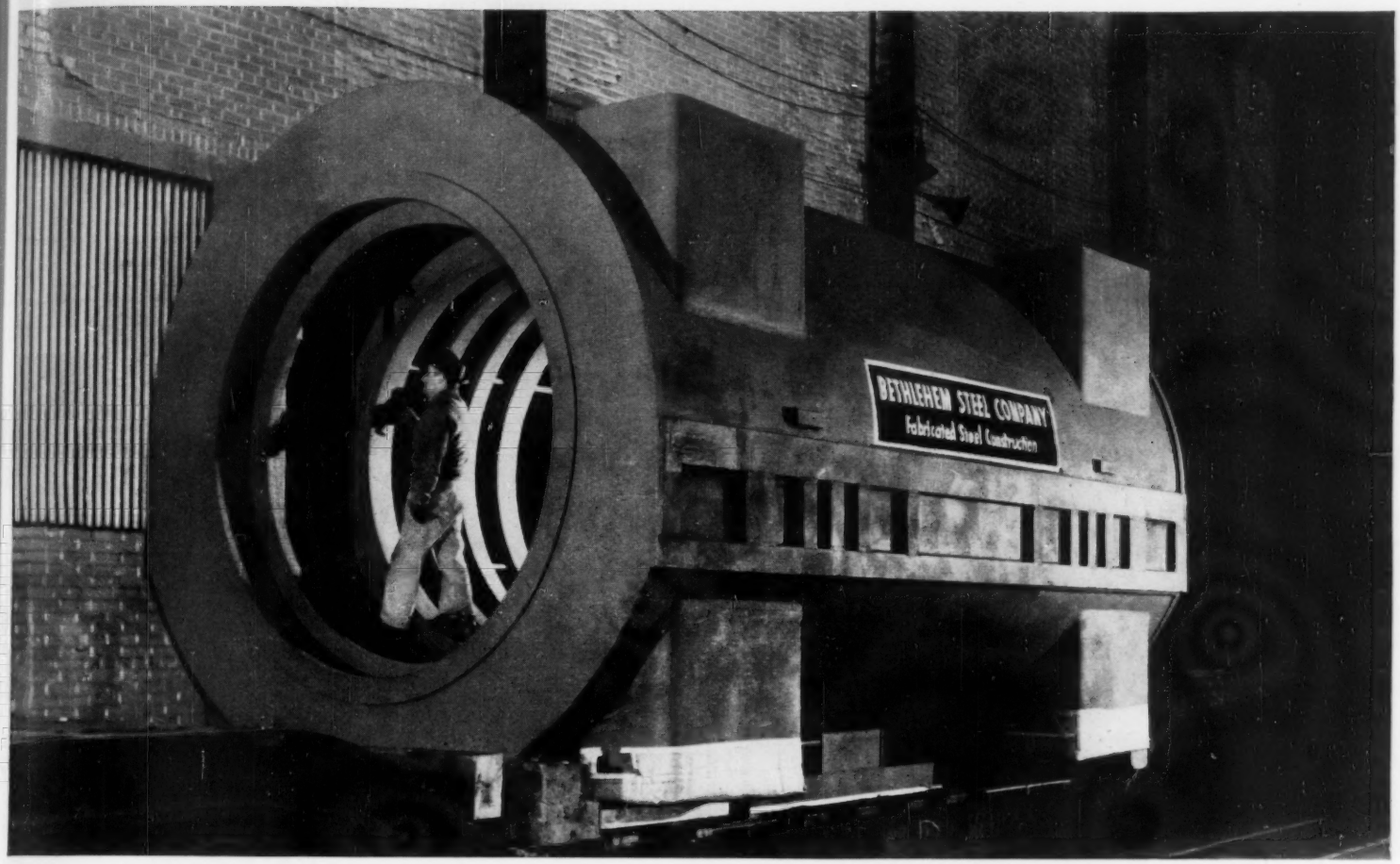
Specially Designed
MACHINE TOOLS
have cut production costs for American Industry



Boring V-8 Engine Cylinders
MOLINE TOOL CO. "HOLE-HOG" MOLINE, ILLINOIS
DRILLING • BORING HONING • TAPPING and Special Machines



▲ Stator frame for 75,000-kva turbo-generator, fabricated from Bethlehem Weldments. The frame has a shell thickness of ¾ in. It is 21 ft, 1 in. long, 12 ft, 5 in. wide, and 12 ft, 10 in. high.

YOU GET FOUR BIG ADVANTAGES WITH BETHLEHEM WELDMENTS

If you are a manufacturer of machinery, or machine parts, chances are good that you can profit through these advantages of Bethlehem Weldments:

1. ECONOMY With Bethlehem Weldments, excess weight is eliminated, without sacrificing rigidity. Nine times out of ten, a reduction in weight means a lower manufacturing cost for your product.

2. VERSATILITY Bethlehem Weldments can be made in unlimited sizes and shapes. They can be used either as simple parts, or as sections of assemblies.

3. FREEDOM OF DESIGN These weldments can be made in practically any design, as the steel can be bent, pressed or shaped in advance of welding, without harm to its physical structure.

4. VARIED USES While Bethlehem Weldments are frequently used alone, they can also be combined effectively with forgings or castings.

If you would like to discuss ways in which you could put weldments to profitable use we shall be glad to arrange for a Bethlehem representative to call at your convenience. All that you need do is to write or phone the nearest Bethlehem office.

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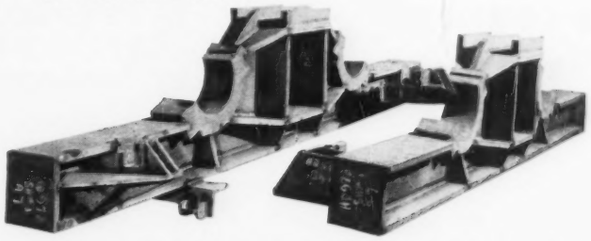
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

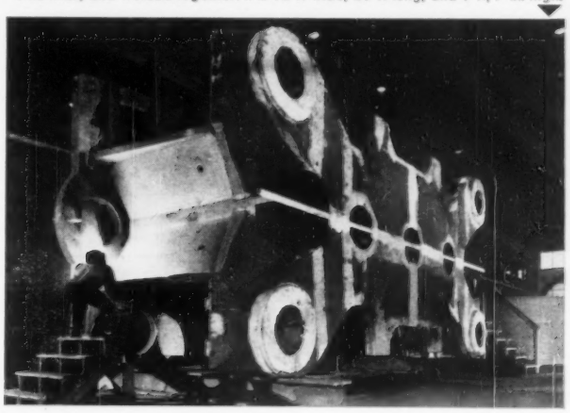
BETHLEHEM STEEL

BETHLEHEM STEEL

These two identical sections, made from Bethlehem Weldments, are side frames for an ore-transfer car. The frames are 2 ft wide. They have a length of 12 ft, 6 in., and are 2 ft, 10 in. high. They were made by welding sections of plate steel, in varying thicknesses. ▼



Shown resting on its side, this Bethlehem Weldment is the crown for an 8000-ton triple-action hydraulic press. It consists of rolled-steel plates and castings, about 6 in. thick, and welded together. It is 12 ft wide, 29 ft long, and 9 ft, 7 in. high. ▼



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Because it does so much, your PRIVATE LINE system saves on monthly rental charges for unnecessary telephone lines and equipment. And you profit in time saved, in boosted output, in greater employee and customer satisfaction.

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CONNECTICUT TELEPHONE & ELECTRIC CORPORATION
Subsidiary of Great American Industries

less belts the mats move under latex sprayers, then into heat chambers which cure the latex.

Excellent resiliency is claimed. A 100-pound weight, covering one square foot, leaves only a faint impression after resting on the cushion for one week.

This portable tape recorder has a recording capacity of two full hours.

On-the-spot recording

is now possible with a new portable tape recorder known as the "Cub Corder." It is equipped to record, play-back, erase, and also has provision for battery recharging.

The machine was designed to fill the needs of persons requiring accurate recording in locations where electric service is not available.

Newspaper, radio, and television reporters are expected to find the device useful in securing data more accurately than by hastily taken notes, according to the manufacturer. Police and fire departments are also prospective users, in addition to the business man travelling by automobile, train, or plane.

The battery has a normal life span of 450 hours. It can be recharged by connecting it directly from the recorder into an automobile cigarette lighter outlet. An accessory charger is available for recharging from conventional electric outlet. The manufacturer is Ectro, Incorporated, Delaware, Ohio.

Awkward overhead

maintenance problems get their come-uppance from a new attachment on a crane truck.

It is known as the Tey Hydro Sky-Lift, and is, in effect, an articulated arm which can lift 500 pounds and hold it within any point within the upper half of a sphere 26 feet in radius. From the crane truck which serves as its base it can be stretched to a working height

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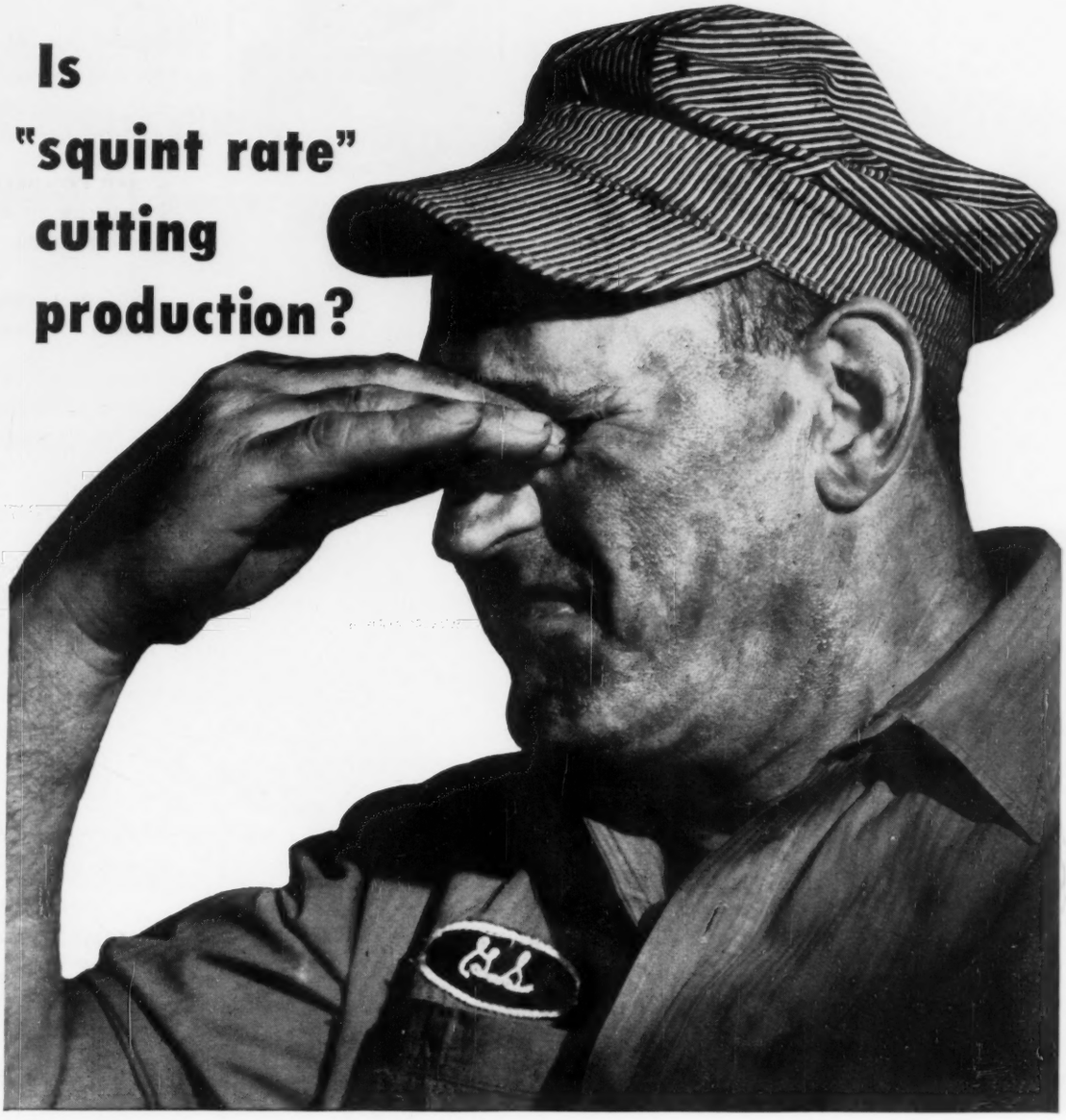
will reach the decision-making executive when his mind is ON BUSINESS

Is "squint rate" cutting production?



If, occasionally, a man in your plant stops his work, squints, rubs his eyes—that could be defective eyesight.

But, if man after man is showing this tell-tale sign of faulty vision – there's something else wrong. And it's an odds-on bet that the cause is bad lighting.

Inadequate or glare-ridden plant lighting, or both, can't help but eat into your people's efficiency and cut production. The very first requisite of a good man, no matter how skilled, is that he be able to see what he's doing, easily, comfortably, without strain.

Poor plant lighting is unfortunate, too, because the difference in first cost between a good and bad installation is surprisingly little. And the healthy upsurge of production you get with good lighting returns many times over that small difference in cost.

Check the "squint rate" in your plant. Isn't it time to call a halt on lighting that's *costing you money?* Isn't it time to change to lighting that *helps production?* Write for information about Day-Brite's CFI Day-Line® industrial fixtures—called CFI because they're designed and built to guarantee Comfort For Industry.

"DECIDEDLY BETTER"
DAY-BRITE
Lighting Fixtures

Day-Brite Lighting, Inc., 5425 Bulwer Ave., St. Louis 7, Mo. In Canada: Amalgamated Electric Corp., Ltd., Toronto 6, Ontario. 348

Now . . . an extremely high-temperature tubing . . . IRVINGTON Silicone -Coated Fiberglas*

If you need a *flexible* insulating tubing that meets Class "H" specifications—and particularly if you need it *now*—look into this new Irvington product!

With the introduction of Silicone *Rubber*-Coated Fiberglas Tubing, Irvington offers to the electrical industry a product that, like the resin-coated type, meets all NEMA Class "H" requirements. In addition, this new tubing has the advantage of extreme flexibility. Its white color is a plus wherever appearance is a factor.

AND . . . Irvington Silicone Rubber-Coated Fiberglas Tubing is available for immediate delivery!

*T.M. Reg. U. S. Pat. Off. by Owens-Corning Fiberglas Corp.

Get the full story—write today for technical data sheet.

Irvington
VARNISH & INSULATOR COMPANY

Difficult maintenance jobs are made easier with new crane truck device.

34 feet from the ground, and used as a platform in a complete horizontal circle.

One or two crow's nests can be placed at the end of the boom. They are fitted with hydraulically-operated controls to govern action at any degree and in all directions.

Shipyards, factories, utilities, and other industries with hard-to-handle maintenance jobs are the expected market, according to the manufacturer, Yale Materials Handling Division, The Yale and Towne Manufacturing Company, Philadelphia, Pa.

A retractable third wheel

has been added to a new magnesium hand truck to make carting and wheeling of heavy loads easier.

With the third wheel in use, the truck is operated in a three-point position, preventing the load from bearing on the operator. After the truck is stopped, it can be re-started without the human energy required to overcome dead load weight.

For conventional use of the truck, the third wheel is folded against the frame.

This is a new model of the all-magnesium Magliner hand trucks, and is manufactured by Magline, Inc., Pinconning, Mich.

Addition of third wheel to hand truck makes material handling work easier.

RIGGS DISTLER & CO., INC.
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CONSTRUCTION

Our many years of seasoned experience and proven performance are now available to help solve your construction problems.

★ **AIR CONDITIONING**
★ **POWER PLANTS**
★ **PLUMBING**
★ **HEATING**
★ **VENTILATION**
★ **ELECTRICAL**

Your inquiries are invited. May we give you more information on whom we serve and discuss how we might serve your company?

43 YEARS
of Experience and Performance

RIGGS DISTLER & CO., INC.
216 North Calvert Street
Baltimore 2, Maryland

1518 Walnut St., Philadelphia 2, Pa.
516 Fifth Ave. New York 36, N.Y.

IDEAL XMAS GIFTS FOR YOUR BUSINESS FRIENDS

Metal Arts Advertising Specialties

Give your business friends a Christmas gift of lasting remembrance—an attractive, useful advertising specialty from Metal Arts bearing your advertising message, seal or trademark.

Hundreds of suggested items to choose from, including smartly styled letter openers, ash trays and memo pads . . . all made of satin-smooth bronze by skilled Metal Arts craftsmen. Each one is individually gift-boxed, ready for mailing.

See your local advertising specialty jobber, or write today for catalog showing our complete line of business gift suggestions.

METAL ARTS CO., Inc.
742 Portland Ave., Rochester 21, N.Y., Dept. 45

Cut Costly Billing Time with

BURROUGHS *DIRECT* MULTIPLIER

Computes and types the complete invoice in one continuous operation.

Computes by direct multiplication—not by repeated addition.

Prints quantity, then prints unit price and total amount simultaneously—no need for machine checking of quantities and price.

Two major steps are cut from costly billing operations when you use the Burroughs Direct Multiplier Typewriter-Billing Machine that types *and* computes an invoice faster than it would ordinarily take to copy it!

In run-of-mine billing procedure, there are three major steps—(1) calculating, (2) typing and (3) machine checking. But this time-saving Burroughs Typewriter-Billing Machine reduces calculating and typing to one single, continuous operation, and no machine checking is needed. Added speed factor—computation is by direct mechanical multiplication, not repeated addition.

Here is the world's fastest billing machine for a wide range of applications. When the time comes to better your billing operations, see your Burroughs man. The Burroughs branch office near you is listed in the yellow pages of your telephone book, or write today to Burroughs Corporation, Detroit 32, Michigan.

WHEREVER THERE'S BUSINESS THERE'S **Burroughs**

UNION PACIFIC RAILROAD

AT YOUR SERVICE

OFFICES IN 71 CITIES

COAST TO COAST

Aberdeen, Washington
Alhambra, California
Astoria, Oregon
Atlanta, Georgia
Bend, Oregon
Birmingham, Alabama
Boise, Idaho
Boston, Massachusetts
Bremerton, Washington
Butte, Montana
Cedar City, Utah
Cheyenne, Wyoming
Chicago, Illinois
Cincinnati, Ohio
Cleveland, Ohio
Council Bluffs, Iowa
Dallas, Texas
Denver, Colorado
Des Moines, Iowa
Detroit, Michigan
Eugene, Oregon
Fresno, California
Gering, Nebraska
Glendale, California
Hollywood, California
Kansas City, Missouri
Las Vegas, Nevada
Lewiston, Idaho
Lincoln, Nebraska
Long Beach, California
Longview, Washington
Los Angeles, California
Memphis, Tennessee
Milwaukee, Wisconsin
Minneapolis, Minnesota
New Orleans, Louisiana
New York, New York
Oakland, California
Ogden, Utah
Omaha, Nebraska
Pasadena, California
Philadelphia, Pennsylvania
Pittsburgh, Pennsylvania
Pocatello, Idaho
Pomona, California
Portland, Oregon
Reno, Nevada
Riverside, California
St. Joseph, Missouri
St. Louis, Missouri
Sacramento, California
Salina, Kansas
Salt Lake City, Utah
San Diego, California
San Francisco, California
San Jose, California
San Pedro, California
Santa Ana, California
Santa Monica, California
Seattle, Washington
Sioux City, Iowa
Spokane, Washington
Stockton, California
Tacoma, Washington
Toronto, Ontario
Tulsa, Oklahoma
Victor, Idaho
Walla Walla, Washington
Washington, D. C.
Winston-Salem, No. Carolina
Yakima, Washington

(And—in addition—passenger and freight representatives at all Union Pacific Railroad stations will be glad to assist you.)

BE SPECIFIC "SHIP" UNION PACIFIC

QUIZ ANSWERS

The Quiz begins on page 186

1. *$1 million;* the shortest railroad operating as Class I as of 1950 was the Texas & Northern, running between Daingerfield and Lone Star in Texas, a distance of 7.6 miles.

2. *83 per cent.* Passenger, mail, express and miscellaneous traffic make up the other 17 per cent. Railroads specializing in commuter service, like the Long Island, derive their major revenue from passenger traffic.

3. *52 per cent.* Wages increased 106 per cent and the prices of materials and supplies more than doubled within the same period.

4. a—*Minneapolis, St. Paul & Sault Ste. Marie*
b—*Delaware & Hudson*
c—*Seaboard*
d—*Baltimore & Ohio*
e—*Chicago, Burlington & Quincy*
f—*Chesapeake & Ohio*
g—*Northern Pacific*
h—*Delaware, Lackawanna, and Western*
i—*Missouri, Kansas, and Texas*
j—*Lehigh Valley Railroad*

5. *42 tons.* Mine products had the highest average at 57.3 tons, while what is designated as forwarder freight was low at 14.1 tons.

6. *2 million.*

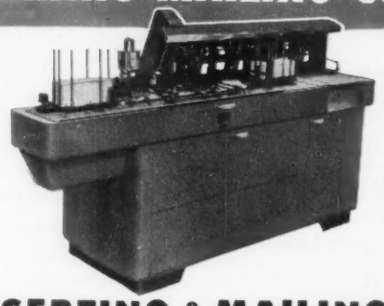
7. a—*6*, b—*5*, c—*1*, d—*2*, e—*7*, f—*9*, g—*8*, h—*10*, i—*3*, j—*4*.

8. *Increased 2 per cent.* In 1951, total revenue amounted to $10.4 billion and in 1952 to $10.6 billion. The increase was attributed to higher freight rates, as well as higher mail and express charges.

9. *Pennsylvania,* with 9,683 miles of track criss-crossing its 45,333 square miles. Illinois has more mileage, but its greater area gives it a slightly poorer ratio. Texas leads in total mileage, 15,888.

10. a—*Atchison, Topeka & Santa Fe, or just Santa Fe*
b—*Union Pacific*
c—*Pennsylvania*
d—*Chicago, Rock Island & Pacific or just Rock Island*

SOARING MAILING COSTS . . .



Brought to Earth!

INSERTING & MAILING MACHINE

. . . Cuts Costs 2 Ways

FIRST, *Inserting & Mailing Machine* slashes cost of preparation—often by as much as 80%. Because it performs all the intricate mailing operations—gathers enclosures, inserts in envelopes, seals, meters postage or prints indicia, counts and stacks. One machine and one operator turn out fifteen or twenty thousand pieces in a few hours!

SECOND, *Inserting & Mailing Machine* mails more pieces for the same postage *without additional handling* expense. When mechanical fingers do the work, it is as easy to mail six, seven or eight enclosures as only one. Yet extra enclosures make friends and influence sales. Ask for a test run of your next mailing.

INSERTING AND MAILING MACHINE CO.

PHILLIPSBURG, NEW JERSEY

GATHERS ENCLOSURES | INSERTS INTO ENVELOPE | SEALS ENVELOPE | PRINTS POSTAGE INDICIA | COUNTS & STACKS